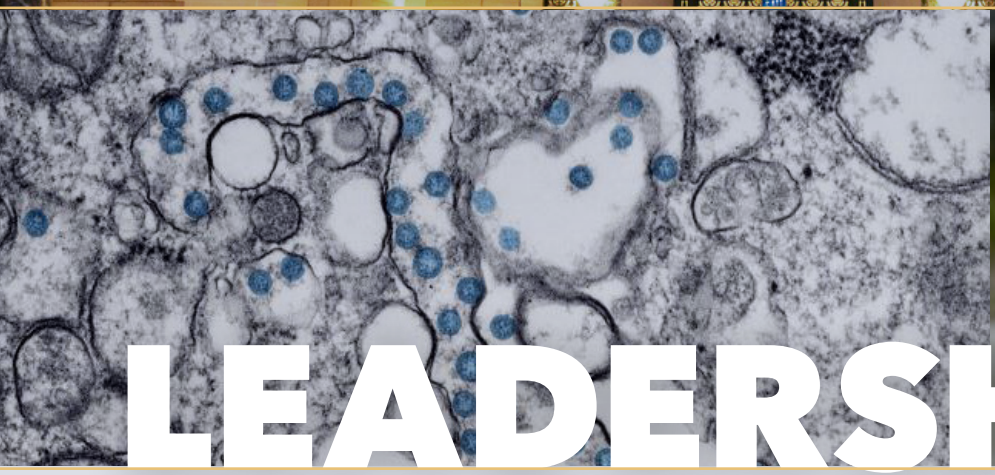

LEADERSHIP INNOVATION IMPACT

ANNUAL REPORT 2020

NATIONAL ACADEMY of MEDICINE

50 years

EXIT

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LETTER FROM THE PRESIDENT

I am proud to highlight the accomplishments of the National Academy of Medicine and its members in this year's Annual Report. Three of the most significant crises we face as a nation and as a global community – the coronavirus pandemic, systemic racism, and climate change – pose extreme existential threats to society and human health. The NAM is deeply committed to addressing these crises and other strategic areas of focus in the years ahead.

Responding to COVID-19

At the outset of 2020, the NAM was preparing to celebrate the 50th anniversary of the founding of the Institute of Medicine (IOM) and the 5th anniversary of IOM's reconstitution as the NAM. Then, the COVID-19 global pandemic struck. By June 2021, the virus had claimed about 3.5 million lives worldwide and infected over 170 million people. Beyond creating an unprecedented health crisis, the pandemic has threatened the global economy, political stability, and social structure.

In 2020 and early 2021, the NAM comprehensively pivoted its strategic priorities and programming to focus on solutions to the pandemic. I am proud that the NAM and its members have demonstrated strong leadership and risen to the challenges created by COVID-19, both nationally and globally.

Early in the pandemic, the National Academies of Sciences, Engineering, and Medicine established a Standing Committee on Emerging Infectious Diseases and 21st Century Health Threats that swiftly engaged with the federal government on urgent questions related to the COVID-19 pandemic and informed decision making at the national and state level.

We also convened an expert committee to address the issue of equitable allocation of COVID-19 vaccine at the request of the National Institutes of Health (NIH) and the U.S. Centers for Disease Control and Prevention (CDC). We have leveraged this report to assist states in preparing for vaccine allocation and distribution and worked with national and local leadership and communities to overcome vaccine hesitancy. Following the release of the report, to help combat vaccine hesitancy in the health care community, we hosted a private town hall for more than 100 U.S. health care leaders to hear from the heads of NIH, CDC, and the Food and Drug Administration about the integrity of the vaccine development process.

We have shared reliable scientific information with the public – including health care providers, policy makers, media outlets, and citizens – by hosting a large number of webinars and workshops on a wide range of topics related to COVID-19, including a highly influential series in partnership with the American Public Health Association.

Our staff, members, and volunteers committed to an all-hands-on-deck approach and together confronted the health and social inequities experienced by vulnerable populations – including people of color, those with mental health and substance use disorders, the elderly, and health care and frontline workers – that were highlighted and exacerbated by COVID-19.

We have also been active in the global space, speaking out on the importance of sustained U.S. support for the World Health Organization amid the pandemic and beyond, urging the Biden administration to donate COVID-19 vaccines to countries in need, and working with organizations and governments worldwide to accelerate global development of testing, vaccines, and treatments.

We will sustain our commitment to COVID-19 throughout 2021 and beyond through a series of nine comprehensive assessments on the health and health care sector's pandemic response, which identify priorities to advance sector- and system-wide change, as well as through a committee that will assess safety reports for COVID-19 vaccines, among many other activities.

Combating Systemic Racism

In the midst of the pandemic, the murder of George Floyd at the hands of a police officer sparked global outrage, citizen protests, and widespread social unrest. This tragic event illuminated the degree to which racism and injustice against Black Americans and other minorities persist in U.S. society today. Further, the COVID-19 pandemic has highlighted the glaring health disparities experienced by Black, Indigenous, and People of Color (BIPOC).

The NAM recognizes that the root cause of these inequities is systemic racism, and as health and medicine professionals, we view racism as a public health crisis in its own right. We are committed to addressing and combating this important issue. Under our Culture of Health Program, we emphasize how society and decision-makers must "broaden their view of health to fully grasp how steep and unjust disparities in social and other conditions limit, thwart, and even destroy some people's ability to live healthy and full lives."

The NAM has made advancing health equity a priority in its mission, and we are prioritizing racial equity in all NAM programs. We have launched a staff committee on internal equity, diversity, and inclusion, and are undertaking efforts to expand BIPOC representation among our membership. There is much more work to be done, but we are committed to making positive change in our work and our institution.

Addressing Climate Change

A third crisis in 2020 – the massive and destructive wildfires in California and Pacific Northwest states – underscored the urgent need to take action on climate change. If ignored, the situation will have dire consequences for the planet, especially for the most vulnerable people among us.

Climate change will have serious consequences for livelihoods, public health, food security, and the availability of water. The effect on food production will impact nutrition and further contribute to social and political instability, and this will in turn lead to greater rates of migration and displacement. All of these factors disproportionately fall on those who already suffer from health inequities – including low-income communities, BIPOC, children, the elderly, and the chronically ill.

The NAM is proud to tackle this crisis head-on in the form of the Grand Challenge on Human Health & Climate Change, a multi-year strategic initiative. This bold initiative will develop a long-term roadmap for transforming systems like health care, infrastructure, and energy that impact or are impacted by climate change; seek to reduce the health sector's environmental impacts and commit to sustainable transformation; and launch a global competition to foster research and actionable solutions at the intersection of climate change and human health.

The NAM Strategic Plan

2021 will mark the fourth year of implementation of the NAM's Strategic Plan, which lays out three overarching goals for the Academy's development: 1) actively identify and address critical issues and lead and inspire action; 2) diversify and activate the NAM membership and engage emerging leaders and scholars; and 3) build leadership capacity across diverse disciplines.

In the year ahead, we will redouble our focus on engaging our members, including through new opportunities to support the careers of fellows and Emerging Leaders in Health and Medicine Program scholars. We will also prioritize the incorporation of new platforms and innovative approaches to accelerate advances in health, science, and medicine and address the social, ethical and workforce implications of these changes – the focus of our Committee on Emerging Science, Technology, and Innovation.

Our Essential Leadership Role

As I have said in the past, we must not be complacent or hesitant in the face of challenges. Health and medicine are at the intersection of each of these three crises, and the NAM is prepared to lead the way in making the positive changes and investments needed in science, medicine, public health systems, and emergency preparedness. We are also committed to leading the way toward reckoning with the United States' shameful history of systemic racism and structural inequalities, as well as reversing years of inaction on climate change.

We believe that with leadership and decisive action, solutions based on science and medicine can be found to these three threats – solutions that will save lives, reduce inequities, and create a safer and more stable world for generations to come.

I deeply appreciate the service, commitment, and support of NAM members, sponsors, staff, and collaborators in advancing these essential goals. It is a true privilege to serve as the president of the Academy, and I look forward to working together in the year ahead.

Sincerely,

Victor J. Dzau, MD
President
National Academy of Medicine

NATIONAL ACADEMY OF MEDICINE
2021–2022 GOVERNING COUNCIL

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Harvard Medical School

J. SANFORD (SANDY) SCHWARTZ, MD
Leon Hess Professor of Medicine, Health Management and Economics
Perelman School of Medicine and Wharton School of Business
University of Pennsylvania
***Sandy Schwartz passed away on June 24, 2021.*

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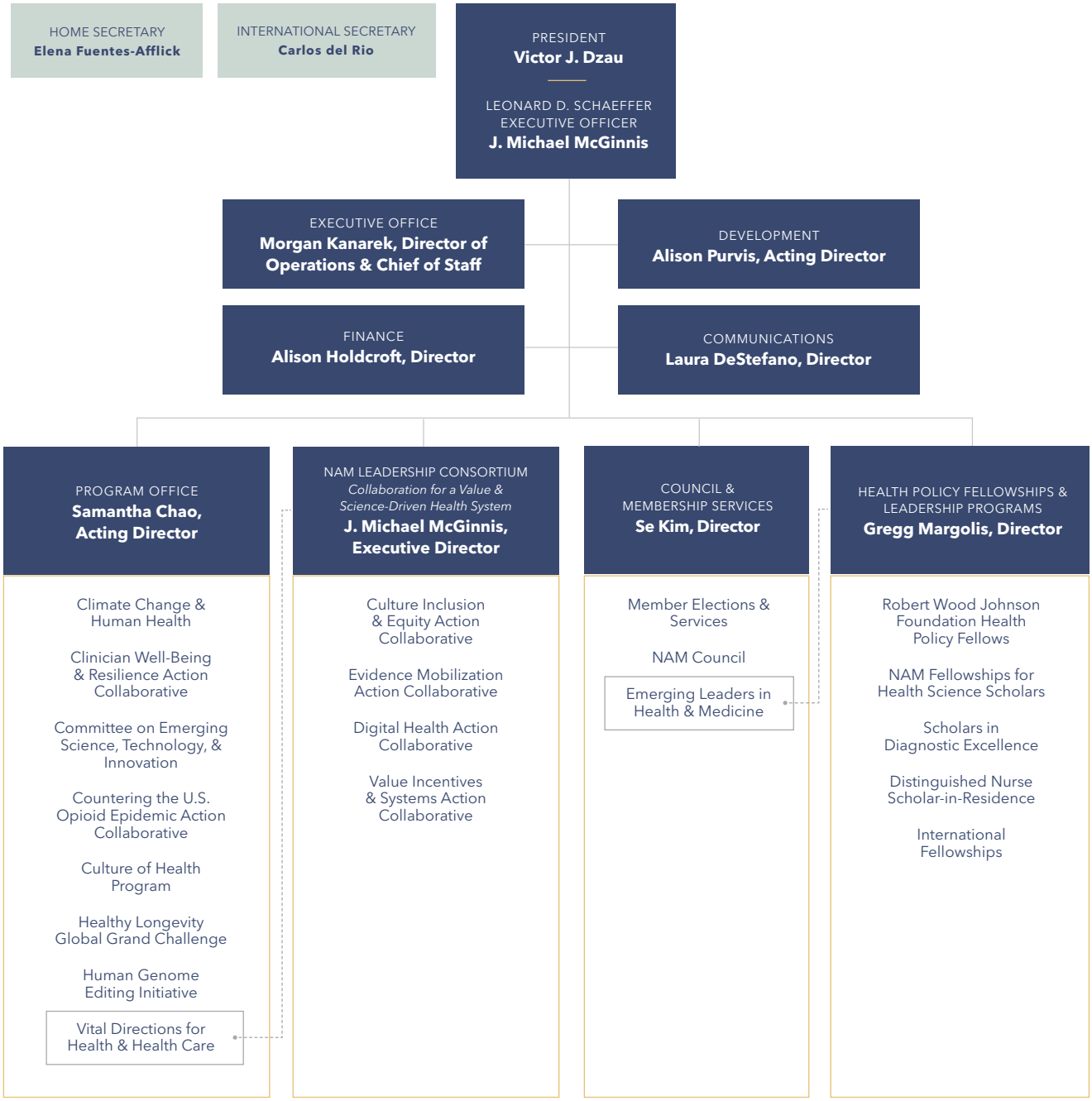
Investigator, Howard Hughes Medical Institute
T.W. Smith Professor of Medicine and Genetics
Harvard Medical School
Brigham and Women's Hospital

HUDA Y. ZOGHBI, MD
Professor, Molecular and Human Genetics, Jan and Dan Duncan Neurological Research Institute
Baylor College of Medicine

NATIONAL ACADEMY OF MEDICINE ORGANIZATIONAL CHART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INTERNATIONAL SECRETARY
Carlos del Rio
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COMMUNICATIONS
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PROGRAM OFFICE
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Clinician Well-Being & Resilience Action Collaborative
Committee on Emerging Science, Technology, & Innovation
Countering the U.S. Opioid Epidemic Action Collaborative
Culture of Health Program
Healthy Longevity Global Grand Challenge
Human Genome Editing Initiative
Vital Directions for Health & Health Care
NAM LEADERSHIP CONSORTIUM
Collaboration for a Value & Science-Driven Health System
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Culture Inclusion & Equity Action Collaborative
Evidence Mobilization Action Collaborative
Digital Health Action Collaborative
Value Incentives & Systems Action Collaborative
COUNCIL & MEMBERSHIP SERVICES
Se Kim, Director
Member Elections & Services
NAM Council
Emerging Leaders in Health & Medicine
HEALTH POLICY FELLOWSHIPS & LEADERSHIP PROGRAMS
Gregg Margolis, Director
Robert Wood Johnson Foundation Health Policy Fellows
NAM Fellowships for Health Science Scholars
Scholars in Diagnostic Excellence
Distinguished Nurse Scholar-in-Residence
International Fellowships

COMMITMENT TO RACIAL EQUITY

Amid the fear, pain, and distress of the COVID-19 pandemic in 2020, the murder of George Floyd at the hands of a police officer in Minneapolis stood out as a watershed moment for the United States and the world, igniting global protests and widespread social unrest.

This senseless and shocking event shone a harsh spotlight on the historic and ongoing pattern of racism, violence, and discrimination suffered by Black Americans and other people of color in our society. Compounding those injustices, the COVID-19 pandemic has elicited divisive rhetoric and violence against the Asian American and Pacific Islander communities and highlighted the glaring health inequities experienced by Black, Indigenous, and people of color (BIPOC).

This disproportionate impact of the pandemic is due to inequities that include uneven access to health care, inadequate or overcrowded housing, a likelihood to work in a frontline job with higher risk of exposure, and a higher rate of suffering from chronic health conditions that make the COVID-19 virus particularly deadly. At the root of these factors is systemic racism.

The NAM views racism as a public health crisis in its own right and the Academy is committed to not just eliminating racism, but also achieving racial equity and ensuring a more just future for everyone.

In 2017, the NAM expanded its mission statement to include "advancing health equity" as a foremost priority. Our pledge to keep health equity at the center of our work means continuing to scrutinize the systemic factors that have led to ingrained health inequities among BIPOC communities as well as taking proactive steps to ensure that these groups will benefit equitably from current and future scientific and medical advances.

Following the murder of George Floyd, NAM President Victor Dzau made a personal commitment to the NAM staff and broader NAM community:

"I commit to ensuring that all people, and especially people of color, feel safe and supported while working at the NAM, as well as to pursuing racial equity in our organizational policies and procedures. I commit to using our platform to improve the lives of people who experience disproportionate health disparities as a result of socioeconomic inequity, bias, and structural racism. I commit to listening, learning, and working with all of you."

Advancing racial equity is a priority across all NAM programs. The Academy acknowledges that BIPOC are historically underrepresented in medicine and biomedical science, which further perpetuates inequitable health outcomes. To address this, the NAM has launched a membership diversity task force and begun to expand BIPOC representation among our membership, although there is a long way to go.

In October 2020, the NAM proudly appointed its first Equity and Inclusion Officer, Ivory Clarke, who also serves as the director of Culture of Health Program (COHP). Over the past five years, COHP has completed four consensus studies on drivers and solutions for health inequities, implemented Community-Driven Health Equity Action Plans, hosted a series of convenings to build bridges between community members and policy makers, and developed a list of resources on health equity in the context of COVID-19. Future COHP priorities include continuing to advance the evidence base, uplifting the voices of people with lived experiences, and addressing racism and equity.

The NAM also launched a Staff Committee on Advancing Racial Equity (CARE) to strengthen internal equity, diversity, and inclusion. CARE has developed a vision and mission to promote a culture that challenges racism openly and honestly through education, training, and self-reflection; dismantle structures and systems that reinforce racial inequity in the NAM's operations; and foster a safe and supportive work environment.

Examining and rebuilding the systems and structures that lead to inequitable outcomes for BIPOC is difficult and often painful, but the NAM believes that equity is worth fighting for. There is more work to be done, but we are hopeful and committed to acting as a force for positive change in our work and our institution.

NAM Staff Committee on Advancing Racial Equity

FORMATION. In response to President Dzau's commitment to advance racial equity at the NAM, a staff committee of 12 was formed to explore how to operationalize this commitment. The Staff Committee to Advance Racial Equity (CARE) meets regularly and has developed a vision and mission statement and outlined a phased approach to develop an organizational strategy to advance racial equity. The NAM has committed resources to ensure that the work of the CARE is sustainable.

- **VISION:** To cultivate and sustain an anti-racist, equitable, and inclusive culture at the National Academy of Medicine
- **MISSION:** To drive deliberate, continuous action toward anti-racism and equity in the National Academy of Medicine by working with staff individually, in their professional roles, and across the organization to:
    - Promote a culture that challenges racism openly and honestly via education, training, and self-reflection
    - Dismantle the visible and invisible structures and systems that reinforce racial inequity in the NAM's operations
    - Foster a work environment that is safe, supportive, and where all staff can thrive

EXECUTION. In December 2020 the committee agreed to participate in a cohort of shared learning with other organizations through the Robert Wood Johnson Foundation's Equity Learning Lab (ELL). The overarching goal of the ELL is to accelerate the uptake of practices, processes, and policies that advance equity, diversity, and inclusion within internal organizational functioning and external mission-focused work.

TRAINING. 19 staff members participated in a three-day Undoing Racism and Community Organizing workshop with the People's Institute for Survival and Beyond. During this workshop, staff explored the roots of racism from a historical context and explored ways in which race, prejudice, and power combine to create systems of oppression in our society. Through dialogue and power analyses staff were able to center their own experiences in their personal and work lives to begin to explore ways in which racism can be undone within and through the NAM.

PROGRAM HIGHLIGHTS

RESPONDING TO CRITICAL & PRESSING ISSUES

Mobilizing to Counter COVID-19

The COVID-19 pandemic has claimed nearly 3 million lives worldwide and infected millions more. It is a health crisis, an economic crisis, and a social crisis. The NAM has been proud to play an important leadership role in the national and global scientific and health communities' efforts to coordinate and develop solutions to end the pandemic.

The NAM has been at the forefront of the national response to COVID-19 since early 2020, working tirelessly to address the complex issues presented by the pandemic. We organized our work into five core areas – leadership, communication, engagement, response, and recovery.

For example, in the very early stages of the pandemic, the National Academies established a Standing Committee on Emerging Infectious Diseases and 21st Century Health Threats that regularly engaged with the federal government on important issues and questions related to the pandemic. The standing committee has so far provided 19 rapid expert consultations to government officials on topics including crisis standards of care, virus shedding, antibody response, laboratory testing, and more. These consultations have informed government decision making at both the national and state levels.

Given the challenges of vaccinating the entire population with an initially limited supply of COVID-19 vaccines, the NAM convened an expert committee to address the issue of equitable vaccine distribution (sponsored by the National Institutes of Health [NIH] and the Centers for Disease Control and Prevention [CDC]). The committee sought to create a well-planned framework – independent of political influence – to help determine the phased allocation of vaccines based on science, public health, social factors, and equity. The resulting *Framework for Equitable Allocation of COVID-19 Vaccine* has been influential, with many states adopting our guidance in combination with the recommendations of the Advisory Committee on Immunization Practices.

Following the publication of the report, we helped to build public trust in COVID-19 vaccines by developing and implementing a robust public outreach strategy. In response to rising vaccine hesitancy – especially among health care providers – we hosted a private town hall for more than 100 influential health care leaders and officials to hear from leaders at NIH, CDC, and the Food and Drug Administration (FDA) about the government's plans for the safe and equitable distribution of COVID-19 vaccines.

The CDC also asked the National Academies to assemble a committee to review the safety of COVID-19 vaccines in 2021. This committee will move quickly to review available information to monitor for potential adverse effects, holding public meetings and issuing timely written reports, actions that are critical to building and sustaining public trust in the safety of the vaccines.

Throughout the pandemic, the NAM and the National Academies have helped to engage the public – including the health care community, policy makers, media outlets, and citizens – by hosting regular webinars, virtual town halls, and workshops on a wide range of topics related to COVID-19. The NAM's webinar series in partnership with the American Public Health Association, COVID-19 Conversations, has hosted 19 events so far, commanding audiences of up to 10,000 at a time.

We have also advised on the equitable allocation of COVID-19 monoclonal antibody therapies and other novel therapeutics and the implementation of evidence-based crisis standards of care at times when cases were surging and hospitals and health care systems were struggling with shortages of critical supplies.

In addition to our work on the national COVID-19 response, the NAM has been active in the global effort as well, as no one country can successfully fight this pandemic on its own. We have spoken out on the importance of sustained U.S. support for the World Health Organization and are working with global organizations and governments to accelerate equitable global allocation of COVID-19 vaccines, as well as therapies and testing.

We know that we cannot truly end the pandemic anywhere until we end it everywhere. We support a strong global response to this pandemic as well as global pandemic preparedness ahead of future potential crises. The NAM is convening dialogues among global leaders to examine how to achieve global solidarity through improved governance and sustainable financing for the global public good in the future.

RESPONDING TO CRITICAL & PRESSING ISSUES

Confronting the U.S. Opioid Epidemic

The NAM's Action Collaborative on Countering the U.S. Opioid Epidemic was established in 2018. Since then, this unique public-private partnership has made great strides toward utilizing evidence-based solutions to effectively battle the U.S. opioid crisis. Originally a two-year engagement, we are pleased to announce that the Action Collaborative has been extended through 2022.

Even before the COVID-19 pandemic hit the United States, the country was gripped by a devastating health crisis – the deadly opioid addiction epidemic that has plagued communities across the country and will have a lasting impact on generations of American families. More than 70 percent of all drug overdose deaths involve opioids, according to the most recent data from the U.S. Centers for Disease Control and Prevention (CDC).

With a multitude of factors contributing to the opioid epidemic, it is clear that no one organization, government agency, or sector can solve this crisis alone. The NAM, seeking to spearhead a collaborative response, in 2018 partnered with the U.S. Department of Health and Human Services (HHS), the Aspen Institute, and HCA Healthcare to establish and co-chair the Action Collaborative on Countering the U.S. Opioid Epidemic. The Action Collaborative has participating members from across the public, private, and nonprofit sectors, including individuals with lived experience.

The Action Collaborative was designed to be a two-year, public-private partnership to foster greater coordination and collective action across the health system and beyond in addressing the opioid addiction crisis. Now extended to 2022, it uses a systems approach to convene and

catalyze public, private, and nonprofit stakeholders to develop, curate, and disseminate multi-sector solutions designed to reduce opioid misuse and improve outcomes for individuals, families, and communities affected by the opioid crisis.

The Action Collaborative began its work by convening the key experts and entities within the U.S. health system into working groups to address the four priority elements of the nation's response to the opioid crisis: health professional education and training; pain management guidelines and evidence standards; prevention, treatment, and recovery services; and research, data and metrics needs. All four of these working groups made significant progress in 2020, and the Action Collaborative was proud to note the impact that its efforts had in increasing collaborations and knowledge among its members.

The Health Professional Education and Training working group last year continued to focus on creating a coordinated, interprofessional, patient- and family-centered framework for the continuum of health professional education that addresses acute and chronic pain management and substance use disorders (SUDs). Because education and training gaps are a key contributor to the opioid epidemic, the working group conducted a comprehensive literature review to identify the critical practice gaps that persist across health professions for acute and chronic pain management and SUDs. It also surveyed accrediting, certifying, licensing and regulatory bodies to determine what educational requirements exist and key areas of unwanted variation across the education continuum for pain management and SUDs. The results will help align requirements and programming across the education and training continuum. As an important first step toward this goal, in November 2020, the Action Collaborative co-hosted a first-of-its-kind summit with the Federation of State Medical Boards to convene health professional state and territorial licensing boards and advance interprofessional alignment of licensing requirements around pain management and SUDs.

The Pain Management Guidelines and Evidence Standards working group in 2020 focused on highlighting and advancing opportunities to strengthen critical aspects of pain management, including patient-centered and evidence-based tapering guidance, multidisciplinary pain management approaches, and judiciously implementing pain guidelines into practice. The group hosted a series of virtual public listening sessions in early 2020 to better understand the state of chronic pain management, focusing on the perspectives of patients and the clinicians who care for them. Data from these sessions are contributing to the ongoing creation of a person-centered pain management visual journey map that will highlight existing practice and system-level gaps in chronic pain management and identify opportunities to address them. The working group, in August 2020, released an in-depth discussion paper on tapering long-term opioid therapy for chronic, non-cancer pain, summarizing best practices, research gaps, and future priorities.

The Prevention, Treatment, and Recovery Services working group in 2020 continued its focus on curating and disseminating best practices and integrated approaches to prevention, treatment and recovery services for opioid use disorder, with guidance for how to implement, scale, and sustain them. The group released a series of discussion papers and commentaries aimed at advancing a continuum of care for opioid use disorder—one paper addressed overcoming obstacles within the current addiction treatment system, another focused on the needs of certain high-risk populations, a third called for strategies to combat the stigma of addiction and a fourth outlined the framework elements of successful systems of care for opioid use disorder.

More than 70 percent of all drug overdose deaths involve opioids, according to the most recent data from the U.S. Centers for Disease Control and Prevention.

The Research, Data, and Metrics Needs working group, which includes representatives from the three other working groups, led the development of a comprehensive, cross-collaborative research agenda that identifies the evidence gaps, research questions, and data and metrics needs identified throughout the Action Collaborative's work. This agenda, which prioritizes the items that should be addressed to combat the opioid crisis, was released in April 2021.

In addition to hosting several virtual public symposiums in the spring and fall of 2020, the Action Collaborative initiated several special projects to support the addiction and pain communities during the COVID-19 pandemic. These included a series of spring 2020 webinars in partnership with the American Society of Addiction Medicine focused on supporting people with addiction during the pandemic, the creation of an online resource page with links to tools and efforts geared to those managing SUDs and pain, and a statement of priorities and actions that need to be taken to protect the health and well-being of individuals with opioid use disorder, other SUDs, and pain in the context of COVID-19.

To learn more about the Action Collaborative's work, visit **NAM.edu/OpioidCollaborative**.

RESPONDING TO CRITICAL & PRESSING ISSUES

Championing Clinician Well-Being & Resilience

The COVID-19 pandemic has impacted everyone around the world, particularly frontline clinicians who have worked tirelessly over the past year to care for the millions of patients infected with the coronavirus. The NAM's Action Collaborative on Clinician Well-Being and Resilience has prioritized addressing and reducing clinician burnout before and during COVID-19, with the aim of sustaining progress long after the pandemic.

Clinician well-being is essential for safe, high-quality patient care. The growing trend of clinician burnout – defined as a chronic imbalance of high job demands and inadequate job resources that leads to emotional exhaustion, depersonalization, and a low sense of accomplishment – is currently at unprecedented levels due to the extreme strain placed on clinicians during the peak surges of the pandemic.

As part of its commitment to addressing and reversing clinician burnout, the NAM in 2017 launched the the Collaborative. The Collaborative established four primary goals:

1. Raise the visibility of clinician anxiety, burnout, depression, stress, and suicide.
2. Improve baseline understanding of challenges to clinician well-being.
3. Advance evidence-based, multidisciplinary solutions to improve patient care by caring for the caregiver.
4. Lay the foundation for long-term culture change.

The COVID-19 pandemic has taken a heavy toll on the well-being of clinicians. The Collaborative has worked to support health care workers as they navigate the challenges of the moment and prepare for the long-term impact of COVID-19 on providers.

As the pandemic hit the United States, the Collaborative compiled a list of resources and disseminated strategies to help clinicians and their employers respond to increasing burnout levels, workplace hardships, and ethical dilemmas due to COVID-19.

In May, the Collaborative partnered with the Accreditation Council for Graduate Medical Education (ACGME), American Hospital Association (AHA), American Medical Association (AMA), and Association of American Medical Colleges (AAMC) to host a webinar that provided a platform for physician, nurse, student, and health system leader voices on the frontlines of health care during COVID-19. The panel delved into critical needs, priorities, and emerging strategies to support the mental health and emotional well-being of clinicians, as it was clear mental health would remain an important issue beyond the pandemic.

In October, the Collaborative hosted a two-day public meeting to elevate the urgency of coordinating national action for the long-term health and well-being of clinicians through COVID-19 and post-pandemic. At the meeting, presenters shared early data on how caregivers, including non-clinical staff, were coping with COVID-19, explored racial disparities perpetuated by structural racism, and analyzed the financial pressures of COVID-19 on hospitals and health systems. Presenters also shared exemplars of health system leadership to improve clinician well-being during the pandemic, and discussed tactical ways to begin implementing effective systems approaches at individual institutions.

The Collaborative hosted a private strategic meeting in January 2021 to articulate a vision for clinician well-being, outline a "model for execution," and identify immediate next steps and a sustainable way to conduct the work of the Collaborative through 2021 and 2022. The Collaborative is launching three new workstreams focused on: 1. Navigating the Impacts of COVID-19 on Clinician Well-Being, 2. Implementing Tools to Improve Clinician Well-Being, and 3. A National Strategy for Clinician Well-Being.

In addition, Collaborative members co-authored three *NAM Perspectives* in 2020: "Electronic Health Record Optimization and Clinician Well-Being: A Potential Roadmap Toward Action," "Stigma Compounds the Consequences of Clinician Burnout During COVID-19: A Call to Action to Break the Culture of Silence," and "Organizational Evidence-Based and Promising Practices for Improving Clinician Well-Being."

The Collaborative co-chairs, Dr.'s Victor Dzau, Darrell Kirch, and Thomas Nasca, authored a *New England Journal of Medicine* perspective paper in May 2020 called, "Preventing a Parallel Pandemic – A National Strategy to Protect Clinicians' Well-Being," which cautioned about the long-lasting psychological impact of the COVID-19 crisis on clinicians and highlighted five high-priority actions that health systems and employers of clinicians, as well as Congress, should take to protect clinician well-being continuously. Dr. Dzau also penned an opinion editorial for the *Los Angeles Times* that further made the case for a full-scale, national effort to help health workers recover from the impacts of COVID-19 and mitigate preexisting drivers of burnout.

As the COVID-19 pandemic begins to recede in 2021 with the widespread dissemination of vaccines, the NAM believes that health system leaders, accreditors, regulators, policy makers, insurers, health IT vendors, researchers, educators, clinicians, and patients must all work together to reduce clinician burnout and foster professional well-being to ultimately improve the experiences and outcomes for patients, families, and clinicians. As its second two-year phase drew to a close at the end of 2020, the Collaborative is proud to announce an extension of its work through 2022, as there has never been a more critical time to invest in clinician well-being.

To access resources from the Action Collaborative, please visit **NAM.edu/CW**.

RESPONDING TO CRITICAL & PRESSING ISSUES

Human Germline Genome Editing

Heritable human genome editing – making changes to the genetic material of eggs, sperm, or any cells that lead to their development (including the cells of early embryos) in a clinical context, with the intent of transferring any resultant embryos to a woman's uterus for gestation – raises not only scientific and medical considerations, but also a host of ethical, moral, and societal issues. The NAM has played an important leadership role in discussions about this emerging technology.

In 2019, the NAM, the U.S. National Academy of Sciences, and the U.K. Royal Society, with the participation of academies of sciences and medicine from around the world, convened the International Commission on the Clinical Use of Human Germline Genome Editing. The Commission – comprised of 18 members from 10 nations with expertise in genome editing technology; human genetics and genomics; psychology; reproductive, pediatric, and adult medicine; regulatory science; bioethics; and international law – was tasked with developing a framework for scientists, clinicians and regulatory authorities to consider technical, scientific, medical, regulatory, and ethical requirements when assessing potential clinical applications of human germline genome editing, should a society conclude that such applications are acceptable. The Commission's goal was to define specific criteria and standards that would be required before heritable human genome editing could be considered for clinical use.

The Commission was overseen by an international oversight board (IOB), comprised of leaders from the public and private sectors, including representative leadership of academies of sciences and medicine. The NAM, the National Academy of Sciences, and the U.K. Royal Society served as the Commission's secretariat, which managed the day-to-day operations of both the Commission and the IOB.

The Commission held three meetings and an international workshop between 2019 and 2020. It engaged with individuals from nearly every continent over the course of its work. Following the first meeting of the Commission, a call for public input was issued. Input received informed the Commission's subsequent deliberations. The Commission's final meeting was used to develop the commission's findings and recommendations.

The Commission's final report, Heritable Human Genome Editing, was released in September 2020. The report said that human embryos whose genomes have been edited should not be used to create a pregnancy until it is established that precise genomic changes can be made reliably and without introducing undesired changes—criteria not yet met. The report specifies stringent preclinical and clinical requirements for establishing the safety and efficacy of heritable human genome editing and long-term monitoring of outcomes. It calls for extensive national and international dialogue before any country makes a determination about whether to permit the clinical use of heritable human genome editing and identifies essential elements of national and international scientific governance and oversight in this area.

The Commission's goal was to define specific criteria and standards that would be required before heritable human genome editing could be considered for clinical use.

This important report has been widely viewed across the world, downloaded more than 6,500 times in 121 countries and covered by a variety of news outlets. The Commission has hosted webinars to discuss its findings and recommendations with the public, the media, the genetic disease and disability communities, and academies of sciences and medicine from around the world.

Looking forward, the NAM will build on the Commission's work and on international summits on human genome editing held in 2015 and 2018. In March 2022, the NAM, the National Academy of Sciences, the Royal Society, the UK Academy of Medical Sciences, and the World Academy of Sciences will convene a third international summit on human genome editing—stay tuned for details soon!

RESPONDING TO CRITICAL & PRESSING ISSUES

Climate Change & Human Health

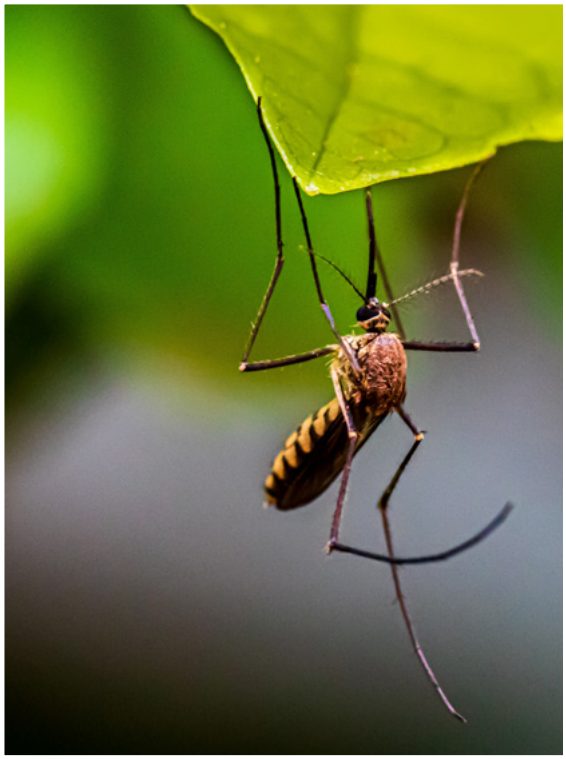
The NAM is taking decisive action to address the health risks of climate change – one of the most significant public health crises of our time.

The NAM has launched the Grand Challenge on Human Health & Climate Change – a multi-year strategic initiative to improve and protect human health, well-being, and equity by working to transform systems that both contribute to and are impacted by climate change.

In 2020, the NAM assembled a 30-member international, multi-sectoral expert Planning Committee, co-chaired by Judith Rodin and Philip Pizzo, to help inform the goals and programmatic activities of the Grand Challenge. Planning Committee members met several times over a six-month period, and the result of their deliberations was a vision and conceptual framework for the Grand Challenge.

Through bold thinking and radical, innovative, and collaborative partnerships with public and private sectors, the Grand Challenge will focus on the following strategic objectives:

- Prioritize and catalyze multi-sectoral actions to drive health sector transformation.
- Develop a comprehensive and long-term roadmap for transforming the systems which most significantly impact and are impacted by climate change, focusing on major actions that would improve and protect human health, well-being, and equity in the long term.
- Stimulate bold and interdisciplinary solutions to accelerate the pace of innovation and transformation.



The Grand Challenge will be led by a Steering Committee, co-chaired by Rodin and Pizzo, and comprised of multi-sectoral experts that will oversee the program's strategy and implementation. An Advisory Council of preeminent thought leaders has also been appointed to advise the Grand Challenge Steering Committee and NAM on the future directions of the initiative.

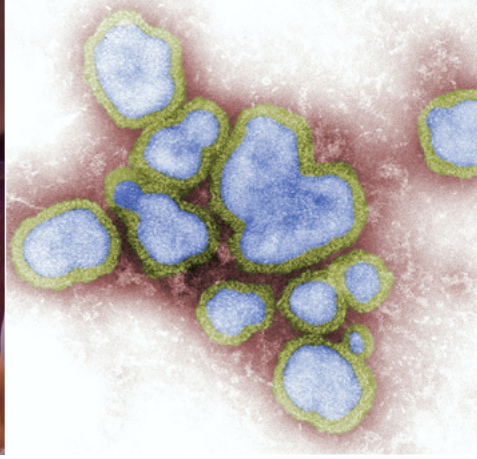
Planning is underway for the first strategic objective of the Grand Challenge, an Action Collaborative on Decarbonizing the Health Sector, which is expected to launch in summer 2021. Working with and building upon current efforts and commitments, the goal of the Action Collaborative is to mobilize the full spectrum of health sector actors and institutions, along with non-health collaborators, to act collectively to reduce the environmental impacts of the health sector and commit to sustainable transformation for the future. Facilitated by the NAM, the Action Collaborative will serve as a neutral platform for participants to advance progress across priority areas through collaboration, coordination, communication, shared learning activities, and collective actions. Action Collaborative participants will include key leaders from the federal government, health and hospital systems, private payers, financing organizations, industry (including biopharmaceuticals, medical devices, and supply chain), health system accrediting bodies, health professional education, academia, and nonprofits, among others.

Later in 2021, planning will kick off for developing a statement of task and work plan for the roadmap on systems transformation. The roadmap will provide a vision, strategy, and recommendations for the transformation of major systems to improve and preserve human health, well-being, and equity by mitigating, adapting, and enhancing their resiliency in response to climate change. In particular, the roadmap will look at the intersection of major economic sectors, such as health care, transportation, housing, labor, food, and agriculture, in terms of how these sectors relate to individual and population health in the context of climate change and how they might be redesigned to promote a more equitable, climate sustaining economy that has a health-promoting, health-centric focus.

Finally, the third strategic objective of the Grand Challenge will focus on creating new mechanisms to inspire and support transformative ideas at the intersection of human health and climate change. As a first step, the NAM partnered with the Burroughs Wellcome Fund to provide a combined $300,000 in project development funds to support interdisciplinary teams across the National Academies to explore promising ideas at the intersection of climate change and human health.

A first-of-its-kind endeavor, the aim of the collaboration is to develop a portfolio of new, interdisciplinary projects to inform the NAM Grand Challenge activities and catalyze broader stakeholder interest and engagement in these issues. In March 2020, opportunity grants were awarded to nine cross-Academies teams for projects covering a diversity of topics at the intersection of climate change and human health, including children's health, mental health, food systems, and carbon emissions, among other critical issues. Grantees conducted the awarded project development activities over the course of 2020 and presented on their progress and plans for future work at an Innovation Showcase in February 2021, which also included major funders in climate and health.

Visit **NAM.edu/ClimateChange** to learn more.



RESPONDING TO CRITICAL & PRESSING ISSUES

Preparing for Seasonal and Pandemic Influenza

Lessons from the COVID-19 pandemic have helped to shape the NAM's new initiative to advance seasonal and pandemic influenza vaccine preparedness and response.

As COVID-19 vaccinations are paving the way toward the early stages of post-pandemic life, the NAM is thinking boldly about how lessons learned during the COVID-19 pandemic can help the world better prepare for future pandemics.

For example, novel influenza viruses continue to be a constant pandemic threat, posing a dual threat on top of the existing COVID-19 pandemic. Both domestic and global efforts, such as the U.S. National Influenza Vaccine Modernization Strategy 2020-2030 and the WHO Global Influenza Strategy 2019-2030, have called for the development of more effective influenza vaccines complemented by modern and adaptable manufacturing technologies that can scale production and meet demand during a pandemic.

At the request of the U.S. Department of Health and Human Services (HHS), the NAM has launched a new initiative on U.S. and global influenza preparedness to assess the global impact that capabilities, technologies, processes, and policies developed for COVID-19 could have on pandemic and seasonal influenza global preparedness and response, especially regarding vaccine development.

The initiative is led by an international committee, co-chaired by Martin Friede and Prashant Yadav, in collaboration with the HHS Office of Global Affairs and the World Health Organization. This committee has convened domestic and international experts across sectors and from a variety of disciplines such as global public health, infectious disease prevention, influenza vaccine research and development, and pandemic preparedness and response.

The committee is tasked with exploring the current state of the art and providing recommendations to improve the global design, composition, clinical trials, production, scale-up, regulatory approval, distribution of influenza vaccines, and post-approval surveillance for adverse events.

These recommendations will be developed by the following four concurrent National Academies consensus study committees and released as four consensus reports in September 2021:

- **Public Health Interventions and Countermeasures**
  This committee will review non-vaccine public health interventions and countermeasures that can be vital to mitigating the spread and impact of a respiratory virus both before and after vaccines are available.
- **Vaccine Research and Development**
  This committee will examine the technological and scientific advances achieved during the global response to COVID-19 and other outbreaks in vaccine research, development and manufacturing, including the use of platform technologies.
- **Global Coordination, Partnerships, and Financing**
  This committee will analyze the current influenza global governance landscape and relevancy of COVID-19 innovations and provide actionable recommendations for strengthening global collaborations, regulations, and financing structures around influenza vaccination.
- **Vaccine Distribution and Supply Chains**
  This committee will examine supply chain and distribution challenges related to vaccines and vaccinations during the COVID-19 response and explore their implications for pandemic and seasonal influenza.

In addition, the NAM will host a public workshop in 2021 to hear from experts and gather feedback to inform the consensus studies.

ADVISING THE NATION & THE WORLD ON HEALTH AND HEALTH CARE

NAM Leadership Consortium

The NAM's **Leadership Consortium: Collaboration for a Value & Science-Driven Health System** provides a trusted venue for national leaders in health and health care to work cooperatively toward their common commitment to effective, innovative care that consistently improves patient experiences and adds value to society. Consortium Members are leaders from core stakeholder communities brought together by their common commitment to steward the advances in science, value, and culture necessary for a health system that continuously learns and improves in fostering healthier people.

The Leadership Consortium held several meetings during the past year, focusing on COVID-19 mitigation measures and lessons learned from the pandemic, the NAM's policy activities, health care perspectives, trends in health care costs, and opportunities for health system transformation under a new presidential administration. One of the meetings featured a presentation from U.S. Surgeon General Jerome Adams on the road ahead in responding and adapting to COVID-19.

In addition, the Leadership Consortium sponsored an initiative involving national thought leaders from nine sectors of health and health care to assess the impact of the COVID-19 pandemic on their sectors, identifying key lessons learned that are applicable both for sector-specific improvements and for broader health system transformation. Their work will be released in 2021 in the form of nine discussion papers addressing the sectors listed below, followed by publication of the full collection with a tenth concluding discussion paper on cross-cutting themes and priority actions:

- Patients, families and communities
- State and local public health
- Care systems
- Health payers
- Health and biomedical research
- Clinicians and professional societies
- Quality, safety, and standards organizations
- Health product manufacturers and innovators
- Digital health

NAM Leadership Consortium Action Collaboratives

The following Leadership Consortium Action Collaboratives engage key stakeholders with similar interests and responsibilities in cooperative activities to advance science, informatics, incentives, and culture and accelerate the health system toward effectiveness, efficiency, equity, and continuous learning. All made notable strides in 2020:

- **Culture Inclusion & Equity Action Collaborative (CIEAC)** - Advancing a culture of health equity and engagement that places the needs of people and communities at its core.

  The CIEAC hosted several widely attended public webinars over the past year. One was focused on engaging patients and families in care settings during the COVID-19 pandemic and on identifying solutions to the continued and existing gaps in engagement, including actions steps needed to advance and spread system-level and policy-level health equity approaches. Another webinar focused on organizational efforts to assess and track internal equity, including examples from institutions that have begun to implement policies and practices to support equity. The CIEAC is also involved with several upcoming publications on topics that include health technology and equity, community health assessments as a tool to improve population health and health equity, and identifying indicators that can be used to measure meaningful community engagement in a wide range of health and health care settings to achieve health equity.

- **Value Incentives & Systems Action Collaborative (VISAC)** - Supporting payment systems that incentivize value and population health.

  The VISAC hosted a February 2020 meeting to engage leaders from public and private sectors to provide feedback and shape progress on ongoing efforts to accelerate the transition away from fee-for-service toward value and population health and measured improvements in population health. This meeting set the stage for an upcoming spring 2021 symposium on integrated payment. A planning committee of integrated care and financing experts have developed a workshop series on financing that rewards better health and well-being. The workshop is aimed at exploring lessons learned throughout the pandemic, discussing integrated payment approaches oriented to whole person and population-wide health outcomes, and identifying transformation strategies that will help the health system incentivize services that maximize individual and population health, rather than service volume.

- **Evidence Mobilization Action Collaborative (EMAC)**- Supporting the conditions necessary for transforming real world experiences into valuable data that are routinely used to improve population and patient-level health.

  The EMAC met in early 2020 to discuss the evolving trends in health data privacy, with particular focus on the implications for the secondary use of health data in support of a learning health system. The EMAC also hosted a public webinar in July 2020, exploring evidence generation and mobilization during the COVID-19 pandemic. It focused on identifying the conditions needed to support rapid collective learning and disseminating information to accurately diagnose and effectively treat and track the novel viral illness while ensuring adequate scientific rigor, statistical power and generalizability in support of a learning health system.

- **Digital Health Action Collaborative (DHAC)** - Fostering improvements and innovation in digital infrastructure so that health technology is developed and applied in ways that consistently lead to better population and patient-level health.

  The DHAC met several times 2020, the first time to discuss the topics of individual control of health data, data sharing, and related challenges. The second meeting, a public webinar in October 2020, explored the convergence of COVID-19 with issues of equity and the implications for the future of digital health development and adoption. It examined the opportunities digital health presents for addressing the current COVID-19 pandemic; bolstering preparedness for future public health crises; ensuring digital engagement; and identifying the societal/cultural, organizational, economic, and technical limitations of using digital health tools in low-resourced and marginalized communities.

As part of an ongoing collaboration with the U.S. Government Accountability Office (GAO), the DHAC developed a discussion paper exploring the use and challenges associated with artificial intelligence (AI) technology in the delivery of health care services in non-traditional care settings such as the home, retail clinics, long-term care, and behavior health facilities. The paper, "Advancing AI in Health Settings Outside of the Hospital and Clinic," was released in November 2020 and was especially timely as it highlighted the use of telehealth and remote monitoring tools for the tracking and management of COVID-19 symptoms. The findings were discussed in a January 2021 webinar with nearly 500 participants.

EMERGING STRONGER AFTER COVID-19:
PRIORITIES FOR HEALTH SYSTEM TRANSFORMATION VISUAL FRAMEWORK

Clinicians

Patients, families and communities

Care systems

Health care payers

Public health

Quality, safety and standards organizations

Research

Digital health

Health product manufacturers and innovators

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ADVISING THE NATION & THE WORLD ON HEALTH AND HEALTH CARE

Advancing Health Equity

Everyone in this country deserves the opportunity to be healthy and reach their full potential no matter who they are or where they live. One of the NAM's top priorities is to create evidence-based solutions that address the root causes of inequity and promote health and well-being for all.

Sustainable change to eliminate barriers to good health starts with a focus on addressing these underlying influences. Structural inequities and unequal allocation of power are the root causes of health inequity. The NAM's Culture of Health Program (CoHP) is a multi-year collaborative effort to identify strategies to create and sustain conditions that support equitable good health for everyone in America. As we know, and the COVID-19 pandemic has underscored, health equity is crucial – and health inequity is costly in both human and financial resources.

With the guidance of an expert advisory committee, the CoHP is working toward four primary goals:

- **Lead:** Build a knowledge base to inform actions and partnerships that will advance health equity.
- **Engage:** Strengthen capacity in communities and inform legal, policy, and system reform.
- **Sustain:** Transform culture to accelerate progress in areas that still have significant health disparities.
- **Translate:** Bridge science to action for impact on health equity and optimal health for all.

The CoHP in 2020 made excellent progress on those goals, including in the following areas:

Program Renewal – In early 2020, the CoHP hosted two in-depth workshops to develop a strategic vision and framework to assist in the design of a second phase of the program that put equity and impact at the center of the program's efforts. Attendance at the workshops included leadership from the NAM, the Robert Wood Johnson Foundation (RWJF), and additional staff from the broader Academies. In November of 2020, at the conclusion of the co-design process, CoHP was renewed for its second phase, with the NAM serving as a scientific partner to RWJF for our collaborative leadership in fostering a Culture of Health. In this phase, the program will focus on addressing two primary root causes of health inequity – structural racism and the unequal allocation of power and resources.

Community Work

The NAM published the CoHP model for developing Community-Driven Health Equity Action Plans, including a published plan for each of five pilot communities, which include the Columbia Gorge Health Equity Collaborative (Columbia Gorge, WA/OR), Magnolia Community Initiative (Los Angeles, CA), United Way of San Antonio and Bexar County (San Antonio, TX), WE ACT for Environmental Justice (Harlem, NY), and Williamson Health and Wellness Center (Williamson, WV).

Meetings

The NAM hosted three stakeholder listening workshops to gain insight on the priorities, challenges, gaps, and areas of opportunity for three key CoHP stakeholder groups: scientific experts and researchers; those with lived experience or organizations that support communities affected by inequity; and decision-makers in sectors that affect the social determinants of health.

In February 2021, the CoHP completed messaging research and testing to explore and make explicit, in the CoHP's work, the connection between structural racism and health disparities. A messaging framework was developed that would infuse findings from the research into the program's various communications channels and activities. A perspective paper will be released in mid-2021 related to this work.

In April 2021, the CoHP held its second phase kick-off meeting with its newly constituted advisory committee. This meeting was a closed session two-day meeting to orient the advisors to the goals, objectives, and strategy for a second phase, as well as to determine the priority areas of the program and map out a course of action for the next two years.

Learn more at **NAM.edu/CultureofHealth**.

ADVISING THE NATION & THE WORLD ON HEALTH AND HEALTH CARE

Vital Directions for Health & Health Care

As the COVID-19 pandemic has reminded us, our most vital and valuable asset is our health. The NAM continues to identify the top-priority health and health care issues that need attention from policy makers. The prioritization of health equity is essential.

In 2016, the NAM established its Vital Directions for Health & Health Care initiative, designed to provide the incoming presidential administration, as well as other policy makers, opinion leaders, and the public with trusted, nonpartisan, evidence-based analysis of the most compelling opportunities and priorities in health, health care, and biomedical science.

The Vital Directions initiative drew on more than 150 of the nation's top researchers and health policy experts from across the country, who authored expert, peer-reviewed papers for a 2017 publication with 19 policy recommendations related to three areas: better health and well-being, high-value health care, and strong science and technology.

Since the Vital Directions seminal publication was released, much has happened in health and health care, underscoring concerns about the nation's persistent challenges related to maternal mortality, the opioid crisis, and pervasive health inequities, among others. In anticipation of the 2020 presidential election, the NAM completed an updated assessment on key priorities and issues of urgent attention for the next administration.

In collaboration with *Health Affairs*, the NAM published a collection of six articles online in early 2021 that address high priority issues which have a particularly compelling need for attention from policy makers and decision-makers. The articles also reflect the current experience with the pandemic and the health inequities that have been drawn out sharply by COVID-19, as well as the implications going forward for action:

- **Vital Directions for Health and Health Care: Priorities for 2021** identifies the overarching theme of this series as the clear and urgent obligation for the U.S. to turn its full attention to the growing problem of health inequities and to structural racism, which perpetuates health disparities.
- **Infectious Disease Threats: A Rebound to Resilience** reviews pandemic preparedness in the U.S. and outlines steps to strengthen our ability to anticipate and respond to future pandemics.
- **Optimizing Health and Well-Being for Women and Children** draws upon a life-course framework to identify promising interventions to improve the health of women and children.
- **Actualizing Better Health and Health Care for Older Adults** identifies six strategies to improve care and quality of life for older adults.
- **Transforming Mental Health and Addiction Services** describes new models of care that focus on mental health and addiction.
- **Health Costs and Financing: Challenges and Strategies for a New Administration** discusses health costs and financing priorities to advance health care access, affordability, and equity.

In addition, the NAM co-hosted with *Health Affairs* a Vital Directions 2021 virtual briefing event in March 2021, featuring an opening keynote from former U.S. Department of Health and Human Services Secretary Kathleen Sebelius, special remarks from former U.S. Senate Majority Leader William H. Frist, MD, and Congresswoman Lauren Underwood (IL-14), and a distinguished panel discussion on the key policy recommendations across the six articles.

NAM President Victor Dzau noted that health equity is the most vital direction in 2021 - "Across the articles contained in the 2021 Vital Directions series is the clear message to the nation – and those stewarding health policy – that the most fundamental obligation is to view health system reform through a health equity lens."

Sponsors of Vital Directions 2021 include the Gordon and Betty Moore Foundation, the John A. Hartford Foundation and the Robert Wood Johnson Foundation. To learn more, visit **NAM.edu/VitalDirections**.

ADVISING THE NATION & THE WORLD ON HEALTH AND HEALTH CARE

The Future of Nursing

***The Future of Nursing: Leading Change, Advancing Health,* released in 2010, set a vision for the nursing profession in 2020. A decade later, the NAM is extending that vision into 2030.**

In May 2021, the NAM released a highly anticipated consensus study, *The Future of Nursing 2020-2030: Charting a Path to Achieve Health Equity,* building on the 2010 report, *The Future of Nursing: Leading Change, Advancing Health* – the most downloaded NAM report in history.

The new study extended the vision for the nursing profession into 2030 and charted a path for the nursing profession to help our nation create a culture of health, reduce health disparities, and improve the health and well-being of the U.S. population in the 21st century. The committee considered newly emerging evidence related to the COVID-19 global pandemic and included recommendations regarding the role of nurses in responding to the crisis created by a pandemic.

The report examined lessons learned from the Future of Nursing Campaign for Action, as well as the current state of science and technology, to inform an assessment of the capacity of the profession to meet the anticipated health and social care demands from 2020 to 2030. In examining current and future challenges, the committee took into account the dramatically changed context and the rapidly deployed changes in clinical care, nurse education, nursing leadership, and nursing-community partnerships as a result of the pandemic.

In developing its recommendations for the future decade of nursing in the United States, the committee study drew from domestic and global examples of evidence-based models of care that address social determinants of health and help build and sustain a culture of health.

Healthy Longevity Global Grand Challenge

Human longevity has never been greater due to breakthroughs in medicine, public health, and social and economic development. This has created a shift in demographics worldwide as populations rapidly age, so the NAM is working to advance health as people age and promote "healthy longevity."

Both nationally and globally, we remain unprepared to support the social, fiscal, and health care needs of the growing elderly population. Combined with declining fertility rates, the rapid aging of the population globally is poised to strain economies, health systems, and social structures worldwide. Successfully maneuvering this demographic transition, while identifying and reaping its potential benefits, will require policies, socioeconomic infrastructures, and innovations that promote and advance the health of older populations.

The NAM's Healthy Longevity Global Grand Challenge is a worldwide movement to improve physical, mental and social well-being for people as they age. The initiative aims to 1) comprehensively address the challenges and opportunities presented by global population aging; 2) catalyze breakthrough ideas and research that will extend the human healthspan; 3) generate transformative and scalable innovations worldwide; and 4) build a broad ecosystem of support by enabling scientists, engineers, innovators, entrepreneurs, health leaders, policy makers, and the public to work together to achieve the promise of healthy longevity.

The Grand Challenge has two parts. The first is the Global Roadmap for Healthy Longevity, which has assembled an independent International Commission to author a comprehensive report assessing the challenges presented by population aging. Through evidence-based findings, conclusions, and recommendations, the report will demonstrate how these challenges can be translated into opportunities for societies globally. The Commission held evidence-gathering workshops on social, behavioral, and environmental enablers for healthy longevity in 2019 and on health care and public health systems for healthy longevity in 2020, respectively. A third virtual workshop is planned for June 2021, focused on science and technology. With equity at its center, the Commission's final report will be released in 2022 and will be shaped by the experiences and impacts of COVID-19 from around the world.

The second part of the Grand Challenge is the Healthy Longevity Global Competition, a multi-year, multi-million-dollar international competition designed to accelerate breakthroughs in healthy longevity through a series of monetary awards and prizes. The competition is open to innovators from over 50 countries and territories and from any background, including science, medicine, public health, technology, entrepreneurship, public policy, social engineering, and beyond. The NAM and its global collaborators have mobilized more than $30 million in funding to date for the Catalyst Phase of the competition.

The Global Competition consists of three phases.

- The first is the Catalyst Phase, starting in 2020 with at least four annual cycles — approximately 470 awards worth $50,000 USD each will be issued globally as seed funding to advance new, innovative ideas.
- The second is the Accelerator Phase, starting in 2021 — awards worth $500,000 to $1 million USD or more will be issued to meritorious Catalyst awardees worldwide who have demonstrated significant progress in order to support the further advancement of their bold ideas.
- The third is the Grand Prize, starting in 2023 — one or more grand prize(s) of up to $5 million USD each will be awarded for achievement of a breakthrough innovation that extends the human healthspan.

The NAM's Healthy Longevity Global Grand Challenge is a worldwide movement to improve physical, mental, and social well-being for people as they age.

In 2020, the NAM and its global collaborators administered the first annual cycle of Healthy Longevity Catalyst Awards in their respective countries or regions. Globally, we received more than 1,500 submissions, with nearly 600 of those for the U.S.-based Catalyst Award Competition. Ultimately, 154 Catalyst Awards were issued in 2020 — worth more than $7.7 million. Twenty-one of those were issued by the NAM to U.S.-based innovators. The NAM and its collaborators participated in a widely viewed virtual announcement event in October 2020.

In early 2021, the NAM and its global collaborators kicked off the second annual cycle of Catalyst Awards. The NAM has secured participation of two additional global collaborators starting in the 2021 cycle: Chile's National Agency of Research and Development and Hong Kong (via a partnership between the Chinese University of Hong Kong and Hong Kong University). In 2021, each entity will fund and administer a Catalyst Award competition in their respective country or region. Chile has committed to issuing six awards per year for three annual cycles (2021–2023). Hong Kong has committed to issuing five awards in 2021, with the possibility of issuing a greater number of awards (open to a broader swath of researchers) in subsequent years.

The Accelerator Phase also begins in 2021, and in 2020, the NAM secured Eisai Co., Ltd. as an additional sponsor of that phase. Eisai will issue Accelerator Awards in 2021–2023 to international Catalyst Award winners that have further advanced their projects and demonstrated proof of concept. Accelerator Awards include a monetary award as well as in-kind business development supports. Other Accelerator sponsors include Johnson and Johnson Innovation and the European Investment Bank, in partnership with the kENUP Foundation.

The Healthy Longevity Global Grand Challenge has attracted growing support. The John A. Hartford Foundation awarded a two-year, $150,000 grant to the NAM in 2020, in support of the Healthy Longevity Global Competition. The grant covers NAM operational costs and a portion of the initial Innovator Summit in 2021. In addition, the Yun Family Foundation and the Bia-Echo Foundation have each gifted $150,000 to support up to six NAM Catalyst Awards specific to reproductive longevity and equality.

In addition, Johnson and Johnson Innovation in 2020 became the principal corporate sponsor of the Healthy Longevity Innovator Summits, gifting $750,000 to the NAM in support of three annual Summits in 2021-2023. The Innovator Summits are multi-day events during which the NAM will convene over 250 individuals from around the globe, including Catalyst Award winners from the previous calendar year, executive leadership from prominent research institutions and industry, venture capitalists and investors, and leading scientists and academic experts, all contributing in some way to the field of healthy longevity. Due to the COVID-19 pandemic, the inaugural Innovator Summit will be held virtually in fall 2021.

The Innovator Summits are designed to foster collaboration and engagement among these diverse participants, and this will still hold true with respect to 2021's virtual Summit. By bringing together innovators from around the globe and connecting them with others who may hold pieces of the puzzle, these Summits are not only an important element in the framework of the NAM's Global Competition but also for catalyzing much-needed breakthroughs that will extend the human healthspan in a measurable and equitable way.

Learn more at **NAM.edu/HealthyLongevity**.

LEADING & INSPIRING FOR THE FUTURE

Committee on Emerging Science, Technology and Innovation (CESTI)

Advances in science and technology are transforming the fields of health and medicine, ushering in emerging technologies like AI and human genome editing. The NAM is at the forefront of assessing these innovations and developing a governance framework.

The NAM in January 2020 established the Committee on Emerging Science, Technology and Innovation in health and medicine (CESTI). CESTI is working to assess emerging scientific advances and technologies in health and medicine, as well as address the potential societal, ethical, legal, and workforce implications and risks of such technologies, with the ultimate goal of developing a multi-sectoral governance framework.

Advances in biomedical science, data science, engineering, and technology are leading to high-pace innovation with tremendous potential to transform health and medicine. Recent examples include artificial intelligence in health care, human genome editing technologies, and new neural technologies, such as brain implants. At the same time, these breakthroughs carry risks and have important implications for society, with particular concerns related to the speed of adoption, the ability to control cost of care, and the potential to exacerbate inequities and challenge social norms and ethics.

CESTI is composed of experts from the fields of health, biomedical science, ethics, social sciences, law, regulation and other disciplines. Co-chairs include Atul Butte, Professor and Director of the Institute for Computational Health Sciences at University of California, San Francisco; George Daley, Professor and Dean of the Faculty of Medicine at Harvard Medical School; and Alta Charo, Warren P. Knowles Professor Emerita of Law and Bioethics at the University of Wisconsin, Madison. CESTI will hold meetings and public workshops to:

- Monitor, anticipate, and identify emerging developments with significant potential to transform health and medicine.
- Address specific cases through collective review.
- Assess the multitude of factors and their interactions that shape the translation of emerging technologies.
- Analyze the potential risks and societal implications posed by these technologies.
- Develop a framework of multi-sectoral governance for emerging technologies.

Learn more at **NAM.edu/CESTI**.

LEADING & INSPIRING FOR THE FUTURE

Global Health Leadership

As the COVID-19 pandemic has highlighted, we are all connected globally. The NAM is taking action, working with partners around the world to devise solutions to common challenges.

MENTAL HEALTH

Globally, mental illness is the leading cause of disability; it affects approximately 1 billion people and has annual costs of about $3 trillion. Unfortunately, significant investment has not been made to address barriers to care or to improve the fragmented and disjointed treatment system.

To address this issue, in 2020, the NAM is partnering on a bold, multi-billion-dollar mental health initiative called Healthy Brains Global Initiative (HBGI). This initiative, co-chaired by Dr. Victor Dzau and Garen Staglin, founder and co-chairman of One Mind, will mobilize partnerships, invest in research, and support breakthrough strategies to improve outcomes for people with mental illnesses and neurological conditions.

Through strategic partnerships with health systems, the scientific community, nonprofit organizations, financial sector and private industry, HBGI will assemble leaders and innovators from around the world to understand and address mental illness and fund solutions. HBGI will establish a $10 billion financing mechanism with a 20-year plan to dramatically accelerate brain health research necessary to understand and develop new treatments and cures for all brain disease. This initiative will deliver impact returns derived by governments and sovereign entities from the direct and indirect reduction of the global burden of mental illness.

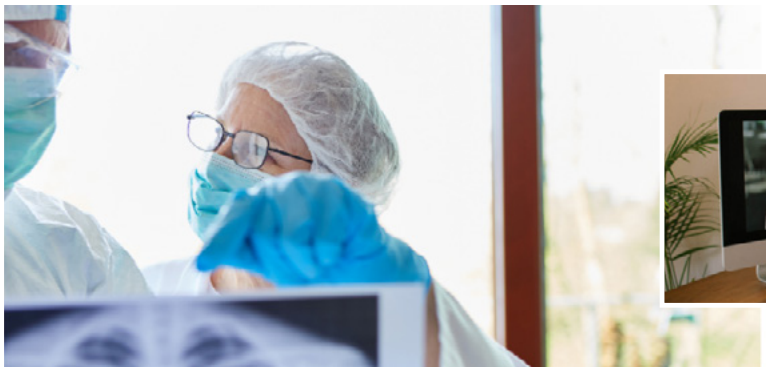
SUSTAINABLE FINANCING

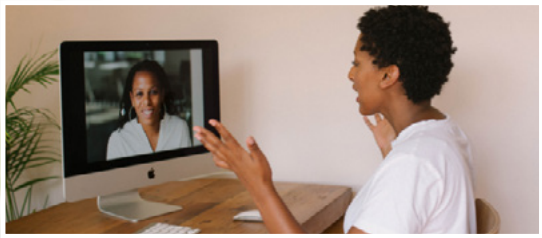
Beyond its involvement with HBGI, the NAM is active in identifying strategies and mechanisms to ensure sustainable financing for global health initiatives. The COVID-19 pandemic has created a global health crisis, which has in turn led to economic and social crises across the world. One major barrier is the absence of proactive, reliable, and sustainable financing for the global commons that are required for pandemic prevention, preparedness and response. Without appropriate financing solutions, the world will not be able to develop an effective and coordinated approach to managing future epidemics.

In early 2021 it was announced that the NAM, alongside Wellcome Trust, will serve as Administrative Secretariat for the newly formed G20 High-Level Independent Panel (HLIP) on Financing the Global Commons for Pandemic Preparedness and Response. The Panel is tasked with identifying the gaps in the financing system for the global commons for pandemic prevention, surveillance, preparedness and response. It will also propose actionable solutions to meet these gaps on a systematic and sustainable basis, and optimally leverage resources from the public, private, and philanthropic sectors and the international financial institutions. The Panel's recommendations will be presented to the G20 Finance Ministers and Central Bank Governors Meeting in July 2021.

NAM Perspectives

The National Academy of Medicine's *NAM Perspectives* health periodical provides a venue for leading health, medical, science, and policy experts to reflect on issues and opportunities important to the advancement of the NAM's mission.





Papers published between January 1, 2020, and May 1, 2021:

- Accountable Communities for Health for Children and Families: Approaches for Catalyzing and Accelerating Success
- Addiction Treatment Networks Cannot Withstand Acute Crises: Lessons from 2021 Winter Storm Uri in Texas
- Advancing Artificial Intelligence in Health Settings Outside the Hospital and Clinic
- Bereavement Care in America is Broken: A Call to Action
- Best Practices, Research Gaps, and Future Priorities to Support Tapering Patients on Long-Term Opioid Therapy for Chronic Non-Cancer Pain in Outpatient Settings
- Care Systems COVID-19 Impact Assessment: Lessons Learned and Compelling Needs
- Children's Access to Healthy Food Suffers When Child Care Programs Close Their Doors
- Combatting the Stigma of Addiction – The Need for a Comprehensive Health System Approach
- Communication and Transparency as a Means to Strengthening Workplace Culture During COVID-19
- Components of the Next Generation of Integrated Care
- Counting Children in the U.S. 2020 Census: Assure Our Future is Represented
- COVID-19: An Urgent Call for Coordinated, Trusted Sources to Tell Everyone What They Need to Know and Do
- Duty to Plan: Health Care, Crisis Standards of Care, and Novel Coronavirus SARS-CoV-2
- Educating Health Professions Educators to Address the "isms"
- Electronic Health Record Optimization and Clinician Well-Being: A Potential Roadmap Toward Action
- Engineering Better Medicine for Public Health Crises and the Future
- Evaluating Two Mysteries: Camden Coalition Findings
- Guide for Future Directions for the Addiction and OUD Treatment Ecosystem
- Health Literacy and Health Education in Schools: Collaboration for Action

- Health Professional Education Student Volunteerism amid COVID-19
- Improving Access to Evidence-Based Medical Treatment for Opioid Use Disorder: Strategies to Address Key Barriers Within the Treatment System
- Improving Short-Term Medical Engagements with Low-to-Middle-Income Countries
- Integrating United States Biomanufacturing Across Vaccines and Therapeutics
- Language, Interpretation, and Translation: A Clarification and Reference Checklist in Service of Health Literacy and Cultural Respect
- Learning from the Global Response to the COVID-19 Pandemic: An Interprofessional Perspective on Health Professions Education
- Maternal Mental Health: Where Should Our Research and Policy Priorities Be?
- Obesity, Biased Mental Models, and Stigma in the Context of the Obesity COVID-19 Syndemic
- Organizational Evidence-Based and Promising Practices for Improving Clinician Well-Being
- Patient and Family Engaged Care: An Essential Element of Health Equity
- People in Hong Kong Have the Longest Life Expectancy in the World: Some Possible Explanations
- Public Deliberation in Service to Health Equity: Investing Resources in Roanoke, Virginia
- Protecting Health Care Workers from Transmissible Airborne Diseases: Challenges and Opportunities
- Public Health COVID-19 Impact Assessment: Lessons Learned and Compelling Needs
- Reimagining Nursing Homes in the Wake of COVID-19
- Stigma Compounds the Consequences of Clinician Burnout During COVID-19: A Call to Action to Break the Culture of Silence
- Supervision Strategies and Community Health Worker Effectiveness in Health Care Settings
- The American Opioid Epidemic in Special Populations: Five Examples
- The Current Understanding of Gestational Weight Gain Among Women with Obesity and the Need for Future Research
- The World Has Changed: Emerging Challenges for Health Care Research to Reduce Social Isolation and Loneliness Related to COVID-19
- Tracking Adolescent Health Behaviors and Outcomes: Strengths and Weaknesses of the Youth Risk Behavior Surveillance System
- What Happens After Disease X: Using One Health to Prevent the Next Pandemic
- What If?: Transforming Diagnostic Research by Leveraging a Diagnostic Process Map to Engage Patients in Learning from Errors
- What is the Value of Social Determinants of Health in Dental Education?

Learn more at **NAM.edu/Perspectives**.

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2020 NOBEL LAUREATES:

Harvey J. Alter
2020 Nobel Prize in
Physiology or Medicine

Alter received one-half of the 2020 Nobel Prize in Physiology or Medicine for his "contribution to the fight against blood-borne hepatitis." Alter is a dual member of the National Academy of Medicine and the National Academy of Sciences.

Jennifer A. Doudna
2020 Nobel Prize
in Chemistry

Dounda received one-half of the Nobel Prize in Chemistry for her work on the development of a method for genome editing. Doudna is a dual member of the National Academy of Medicine and the National Academy of Sciences.

2020 Annual Meeting

The NAM's 50th Annual Meeting, **"Confronting Urgent Threats to Human Health & Society: COVID-19 and Climate Change,"** took place on October 17-19, 2020, and was delivered entirely virtually for the first time due to the COVID-19 pandemic. This year, the NAM Member Interest Group meetings, which allow members from different disciplines to convene on pressing challenges, were also open to the public for the first time.

During the scientific symposium on October 19, **Bill Gates** of the Bill & Melinda Gates Foundation set the stage with a special keynote address titled "Crises, Fast and Slow," which highlighted the dual global threats of COVID-19 and climate change. A thought-provoking panel on the scientific, policy, and political complexities of the COVID-19 pandemic opened by **Anthony ("Tony") Fauci** (Director, National Institute of Allergy and Infectious Diseases) and moderated by **Sanjay Gupta** (CNN Chief Medical Correspondent) followed the keynote. A second panel discussing the nexus of human health, climate change, and equity, featured a keynote by **Sir Andrew ("Andy") Haines** of the London School of Hygiene and Tropical Medicine and broadened the discussion on the health imperative to address environmental issues.

Ursula von der Leyen, President of the European Commission, delivered the President's Forum keynote, bridging the issues of global health policy, COVID-19, and climate change, as well as the role of science in policymaking and addressing global threats. The following panel discussion explored the convergence of the existential threats of COVID-19, climate change, and structural racism as well as solutions through policymaking and leadership.

The meeting garnered more than 10,000 viewers across six continents and media mentions in top outlets such as the *Washington Post, New York Times,* CNN, *Los Angeles Times,* and *USA Today.*

The NAM is grateful to the 2020 scientific program planning committee:

- **Jeffrey R. Balser,** Vanderbilt University Medical Center (Chair)
- **John M. Balbus,** National Institute of Environmental Health Sciences
- **Carlos del Rio,** Emory University School of Medicine and the National Academy of Medicine
- **Lynn Goldman,** George Washington University
- **Richard J. Jackson,** University of California, Los Angeles
- **Margaret Hamburg,** former Commissioner, U.S. Food and Drug Administration
- **Dan Hanfling,** In-Q-Tel
- **Ashish K. Jha,** Brown University School of Public Health
- **Ann Kurth,** Yale School of Nursing
- **Maureen Lichtveld,** Tulane University School of Public Health and Tropical Medicine
- **Nicole Lurie,** Coalition for Epidemic Preparedness Innovations
- **Jonathan Patz,** University of Wisconsin-Madison
- **Philip A. Pizzo,** Stanford University
- **David A. Relman,** Stanford University School of Medicine and VA Palo Alto Health Care System
- **Judith Rodin,** formerly The University of Pennsylvania and The Rockefeller Foundation
- **Susan R. Weiss,** Perelman School of Medicine at the University of Pennsylvania

The IOM/NAM Anniversary Celebration

The year 2020 marked the 50th anniversary of the founding of the Institute of Medicine (IOM) and the 5th anniversary of the IOM's reconstitution as the National Academy of Medicine. A year of anniversary events were planned, to include a series of symposia, commemorative books, and a public outreach campaign around the impact of the IOM/NAM, culminating in a celebratory gala. When the COVID-19 pandemic struck, many of these activities were postponed as the NAM reoriented its programming to focus on solutions to the crisis.

An exception was a series in honor of the IOM/NAM anniversary published by the *New England Journal of Medicine*. NAM members authored over a dozen papers exploring the past, present, and future of fields that have been major areas of focus and impact for the organization, including:

- HIV/AIDS
- Quality of health care
- Cancer
- Aging
- Veterans' health
- Obesity
- Human genetics & genomics
- Vaccines
- Cardiovascular disease
- Emerging infectious diseases
- Health inequities
- Women's health
- Learning health care system

See the full series at **NEJM.org/nam-health-progress**.

Anniversary activities will continue throughout 2021, with a focus on the next 50 years of impact and the most pressing challenges that confront humanity.

IN MEMORIAM

The National Academy of Medicine honors the life and work of members who passed away between January 1, 2020, and May 10, 2021.

Kathryn V. Anderson
Ben D. Barker
G. O. Barnett
John G. Bartlett
Jose Baselga
Richard E. Behrman
Eula Bingham
R. D. Blim
Clara D. Bloomfield
Robert L. Brent
William R. Brinkley
Dan W. Brock
William B. Carey
Charles C. Carpenter
Ernest G. Cravalho
William H. Danforth
William C. Dement
Ronald S. Duman
Mitzi L. Duxbury
Thomas S. Edgington
Neil J. Elgee
Maurice S. Fox
Renee C. Fox
Charles K. Francis
Sanjiv Gambhir
H. J. Geiger
Frederick K. Goodwin
Joseph C. Greenfield, Jr.
Merwyn R. Greenlick
James G. Haughton
H. C. Haywood
James S. Jackson
Marjorie K. Jeffcoat
Richard J. Johns
Donald Kennedy
Sung Wan Kim
Philip Leder
Philip R. Lee
Bernard Lown
Joanne R. Lupton
Floyd J. Malveaux
Paul A. Marks
Robert R. Marshak
Charles A. McCallum
Bruce S. McEwen
Edward W. Merrill
Mario J. Molina
Robert M. Nerem
Arthur W. Nienhuis
James G. Nuckolls
Sten Orrenius
John W. Owen
Robert W. Schrier
Seymour I. Schwartz
Guillermo Soberon
Margaret G. Stineman
James E. Strain
Robert Straus
Takashi Sugimura
Leslie G. Ungerleider
Bailus Walker, Jr.
Zena Werb
Catherine M. Wilfert
James T. Willerson
Flossie Wong-Staal

Fellowships & Leadership Programs

The NAM administers six fellowships and leadership programs designed to prepare the next generation of leaders in health and medicine. These include:

- **Robert Wood Johnson Foundation (RWJF) Health Policy Fellows program – which, after nearly 50 years in operation, is the Academy's longest-standing program**
- **Distinguished Nurse Scholar-in-Residence program**
- **NAM Fellowships for Health Science Scholars – seven subject-specific programs for high-potential early-career professionals**
- **International Fellowships**
- **NAM Scholars in Diagnostic Excellence program – newly launched this year**
- **Emerging Leaders in Health and Medicine – a program to support professionals in health care as they innovate, collaborate, and implement core programmatic values**

Together, the NAM's growing portfolio of fellowships and leadership programs is intended to shape the next generation for leadership, innovation, and impact in health, medicine, and biomedical science.

The NAM Scholars in Diagnostic Excellence Program

The NAM is proud to announce a new fellowship, the NAM Scholars in Diagnostic Excellence program. Launched in January 2021 and funded by the Gordon and Betty Moore Foundation in collaboration with the Council of Medical Specialty Societies, the program aims to develop a cadre of leaders to raise awareness of effective strategies that reduce diagnostic errors across a range of specialties and societies nationally.

Each year, the initiative will select up to 1 scholars based on their professional qualifications, accomplishments, demonstrated leadership in the field, the potential to advance diagnostic excellence, as well as the quality, feasibility, and implementation of their project proposals. Selected scholars will receive a stipend of $35,000, build on the National Academies consensus report *Improving Diagnosis in Health Care,* and be paired with a mentor with subject-specific expertise. Beginning in July 2021, the inaugural class of scholars will participate in a structured online curriculum, cohort learning activities, and professional network opportunities designed to enhance their knowledge and skill as well as accelerate their career development in diagnostic quality and safety.

2021 SCHOLARS IN DIAGNOSTIC EXCELLENCE

Including titles of project proposals

Jonathan Baghdadi, MD, PhD
Assistant Professor, Department of Epidemiology and Public Health, University of Maryland School of Medicine

"Diagnostic Stewardship of Multiplex Molecular Panels to Reduce Diagnostic Error"

Komal Bajaj, MD, MS-HPEd
Chief Quality Officer, NYC Health + Hospitals/ Jacobi Professor of Obstetrics and Gynecology and Women's Health, Albert Einstein College of Medicine

"Not a moment to lose! Using simulation to identify and mitigate diagnostic errors that contribute to delays during maternal hemorrhage care"

Efrén J. Flores, MD
Assistant Professor of Radiology, Harvard Medical School Officer, Radiology Community Health and Equity Radiologist, Thoracic and Emergency Divisions Faculty, The Mongan Institute, Massachusetts General Hospital

"A community-based participatory approach to understand current and emerging barriers and promoters to lung cancer screening (LCS) one-year post-COVID-19 pandemic start and guide culturally tailored LCS outreach among Latino communities"

Linda Geng, MD, PhD
Clinical Assistant Professor, Department of Medicine, Stanford University

"Improving the diagnosis of underrecognized diseases in racial and ethnic minorities through patient engagement and empowerment"

Traber D. Giardina, PhD, MSW
Assistant Professor, Department of Medicine, Baylor College of Medicine
Investigator, Center for Innovations in Quality, Effectiveness and Safety, and Michael E DeBakey Houston Veteran Affairs Medical Center

"Overcoming Barriers to Diagnostic Safety for Underrepresented Populations: Implementing Structured Tools to Engage Patients in Diagnosis (The ISTEP Dx Project)"

Cornelius A. James, MD
General Internist and General Pediatrician Medical Educator, Departments of Internal Medicine and Pediatrics, University of Michigan Medical School

"Data Augmented, Technology Assisted Medical Decision Making and Diagnosis (DATA-MD): A Novel Curriculum"

Jessica Keim-Malpass, PhD, RN
Associate Professor, Department of Acute and Specialty Care, School of Nursing
Department of Pediatrics, School of Medicine, University of Virginia

"Developing an economic framework to achieve diagnostic excellence in sepsis: Achieving balance between early diagnostic action and medical overuse"

Mei-Sing Ong, PhD
Assistant Professor, Department of Population Medicine, Harvard Medical School and Harvard Pilgrim Health Care Institute

"A data-driven approach toward understanding the patterns of diagnostic delay"

Jorge Rodriguez, MD
Clinician-Investigator, Division of General Internal Medicine and Primary Care, Brigham and Women's Hospital

"Towards Diagnostic Equity: Evaluating Diagnostic Error in Telemedicine Among Limited English Proficient Patients Presenting with Abdominal Pain"

Lekshmi Santhosh, MD, MAEd
Assistant Professor of Pulmonary/Critical Care Medicine and Hospital Medicine, Department of Medicine, University of California, San Francisco

"PAUSE for Uncertainty: Development & Implementation of a Novel Framework for Diagnostic Uncertainty During Transitions of Care"

2020-2021 ROBERT WOOD JOHNSON FOUNDATION (RWJF) HEALTH POLICY FELLOWS

Catherine Cerulli, JD, PhD
University of Rochester Medical Center
Placement: Office of Senator Chris Murphy (D-CT)

Michael Dulin, MD, PhD
University of North Carolina at Charlotte
Placement: House Committee on Energy and Commerce (Majority)

Stephanie Gibbs, JD
State of Tennessee, Division of Tenncare
Placement: Office of Senator Tim Kaine (D-VA)

Walter Greenhalgh, MD
Walter Reed National Military Medical Center, National Capital Region Medical Directorate, Defense Health Agency
Placement: Office of Senator Ben Cardin (D-MD)

Carolyn Mendez-Luck, PhD, MPH
Oregon State University
Placement: Senate Special Committee on Aging (Majority)

Judy Schaechter, MD, MBA
University of Miami, Miller School of Medicine
Placement: Senate Committee on Health, Education, Labor & Pensions (HELP) (Majority)

THE NAM FELLOWSHIPS FOR HEALTH SCIENCE SCHOLARS

Norman F. Gant/American Board of Obstetrics and Gynecology Fellowship

Saul D. Rivas, MD, MSPH (2019-2021)
Assistant Professor, Department of Obstetrics and Gynecology
University of Texas Rio Grande Valley School of Medicine

James C. Puffer, M.D. American Board of Family Medicine (ABFM) Fellowship

Lars Peterson, MD, PhD (2019-2021)
Vice President of Research
American Board of Family Medicine

Rita Hamad, MD, PhD (2020-2022)
Associate Professor in Residence
Director, Social Policies for Health Equity, Research (SPHERE) Program, Department of Family and Community Medicine, Philip R. Lee Institute for Health Policy Studies, and School of Medicine
University of California, San Francisco

Gilbert S. Omenn Fellowship

Anaeze Offodile II, MD, MPH (2019-2021)
Assistant Professor and Executive Director, Clinical Transformation
Department of Plastic and Reconstructive Surgery, The University of Texas M.D. Anderson Cancer Center

American Board of Emergency Medicine Fellowship

Arjun Venkatesh, MD, MBA, MHS (2019-2021)
Associate Professor and Chief, Section of Administration, Department of Emergency Medicine
Scientist, Center for Outcomes Research and Evaluation, Yale University School of Medicine

Greenwall Fellowship in Bioethics

Rachel Fabi, PhD (2019-2021)
Assistant Professor, Center for Bioethics and Humanities, SUNY Upstate Medical University

Fellowship in Pharmacy

Adam Bress, PharmD, MS (2020-2022)
Associate Professor of Population Health Sciences
Division of Health System Innovation and Research
University of Utah School of Medicine

Fellowship in Osteopathic Medicine

Julieanne P. Sees, DO, FAAOS, FAOAO, FAOA (2020-2022)
Associate Professor; Sidney Kimmel Medical College, Thomas Jefferson University, Philadelphia
Orthopedic Surgeon, Division of Orthopedics, Department of Orthopedics
Nemours/Alfred I. duPont Hospital for Children

THE 2020-2021 NURSE SCHOLAR IN RESIDENCE

Ashley Darcy-Mahoney, PhD, NNP-BC, FAAN
Associate Professor & Neonatal Nurse Practitioner
Director of Infant Research, Autism and Neurodevelopmental Disorders Institute
The George Washington University School of Nursing

INTERNATIONAL FELLOWSHIPS

NAM International Health Policy Fellowship
Roger Chung, PhD, MHS (2018-2020)
Associate Director, Institute of Health Equity
Assistant Professor, Institute of Ageing
The Jockey Club School of Public Health and Primary Care
The Chinese University of Hong Kong

NAM-HKU Fellowship in Global Health Leadership
Chinmoy Sarkar, PhD, MSc (2019-2020)
Assistant Professor of GIS, Urban Health and Environment, The University of Hong Kong

Kai Ning Cheong, MBBS, MRCPCH, DTM&H, FHKAM, FHKCPaed (2020-2021)
Associate Consultant, Pediatric Rheumatology and Immunology, Hong Kong Children's Hospital & Queen Mary Hospital

CELEBRATING 8 YEARS OF THE FDA TOBACCO REGULATORY SCIENCE FELLOWSHIP PROGRAM

After successfully running for 8 years, from 2012 to 2020, the FDA Tobacco Regulatory Science Fellowship program came to an end. The fellowship advanced the work of the Center for Tobacco Products and address tobacco use, which is the leading cause of preventable death in the United States. The program offered fellows a unique opportunity to further define and develop the field of regulatory science as it relates to the regulation of tobacco products. Fellows participated in the development of science-based public health strategies, served as leaders for defined projects, met with policy leaders, and acquired new knowledge related to tobacco products and their use. 35 professionals were able to gain invaluable educational opportunities as fellows and expressed high satisfaction with the program throughout its lifetime. Since completing their fellowships, more than half of the fellows have continued to be highly engaged in tobacco science-related work or public health.

Emerging Leaders in Health and Medicine

The Emerging Leaders in Health and Medicine (ELHM) program identifies and engages individuals who are relatively early in their careers who are already making important contributions in advancing progress at the frontiers of health, medicine, science, and society. There are two components to the program: the Emerging Leaders Scholars and the Emerging Leaders Forum. Both facilitate opportunities for collaboration and innovation among emerging leaders, NAM members, and experts across sectors. Ten Scholars are chosen each year for 3-year terms of ongoing mentorship and interface with NAM activities, including planning the Emerging Leaders Forum. The annual 3-day Forum convenes about 100 emerging leaders drawn from multiple disciplines and organizations across the country for cutting-edge and collaborative discussions. Through their engagement, ELHM participants provide valuable input and feedback to help shape the priorities of the NAM and sustain the NAM's impact and reputation as a national leader in advancing knowledge and accelerating progress in science, medicine, policy, and health equity.

2020-2021 Emerging Leaders Scholars

Ami S. Bhatt, MD, PhD
Stanford University

Maria Elena Bottazzi, PhD
Baylor College of Medicine

Paul P. Christopher, MD
Brown University

Christopher R. Cogle, MD
University of Florida

Carrie H. Colla, PhD
Geisel School of Medicine at Dartmouth

Adaeze Enekwechi, PhD, MPP
Independent Consultant

Oluwadamilola "Lola" Fayanju, MD, MA, MPHS
University of Pennsylvania

Jordan Green, PhD
Johns Hopkins University

Marcia Haigis, PhD
Harvard Medical School

Kelli Stidham Hall, PhD, MS
Columbia University and Emory University

Ronald L. Hickman, Jr., PhD, RN, ACNP-BC, FNAP, FAAN
Case Western Reserve University

Ehsan Hoque, PhD
University of Rochester

Leora Horwitz, MD
New York University School of Medicine

Mark Huffman, MD, MPH
Northwestern University Feinberg School of Medicine and The George Institute for Global Health

Ning (Jenny) Jiang, PhD
University of Pennsylvania

Caprice Knapp, PhD
State of North Dakota

Miguel Marino, PhD
Oregon Health & Science University

Mark Neuman, MD
University of Pennsylvania

Ziad Obermeyer, MD
University of California, Berkeley

Minal Patel, PhD, MPH
University of Michigan

Brea Perry, PhD
Indiana University

Nathan Price, PhD
Onegevity Health, a division of Thorne HealthTech

Suchi Saria, PhD, MSc
Johns Hopkins University

Jacob Sherkow, JD, MA
University of Illinois College of Law

Hanni Stoklosa, MD, MPH
Brigham and Women's Hospital Harvard Medical School

Hassan A. Tetteh, MD, MBA, MPA, MS
United States Navy and Uniformed Services University of the Health Sciences

Keegan Warren-Clem, JD, LLM
Medical-Legal Partnerships at Texas Legal Services Center and The University of Texas School of Law and McCombs School of Business

Jonathan Watanabe, PharmD, MS, PhD, BCGP
University of California, Irvine

Jeffrey K. Wickliffe, PhD, MS
University of Alabama at Birmingham

2021 Emerging Leaders Forum

Each year, some of the nation's most promising emerging leaders in health and medicine gather to explore the most pressing current challenges in health and medicine, with the aim of stimulating collaboration and interdisciplinary solutions. The 2021 Emerging Leaders Forum was held on April 20-21, 2021. Approximately 75 emerging leaders and 35 NAM members gathered virtually for the event. A planning committee made up of ELHM Scholars designed the 2021 forum, with input from NAM leadership, to provide opportunities to present and build upon their work, identify novel and inventive strategies of tackling commonly shared personal and professional challenges, and network with NAM members and each other. The forum featured interactive panel sessions developed by the Scholars; networking lunches; plenary panels on building ethical careers and the effective uses of storytelling in policy communication; a keynote address by Barry Coller of The Rockefeller University; and small-group discussions about cross-cutting areas of interest.

AWARDS

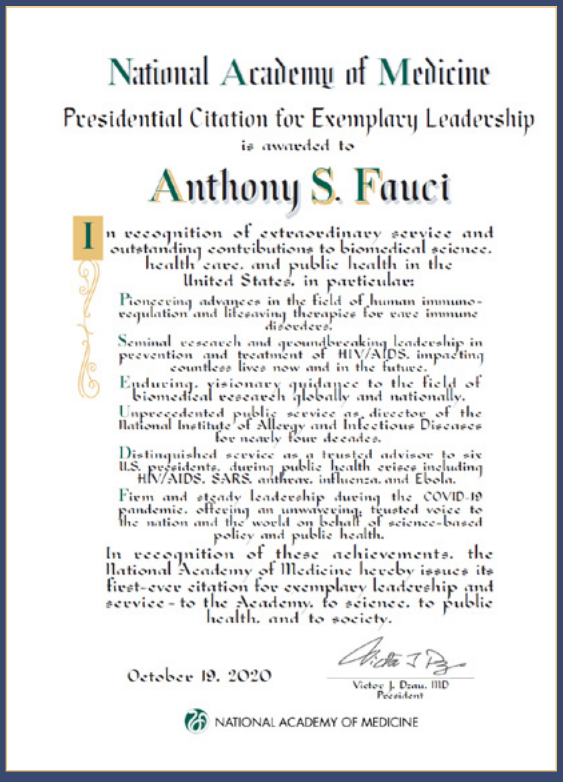
NAM HONORS DR. ANTHONY S. FAUCI WITH PRESIDENTIAL CITATION FOR EXEMPLARY LEADERSHIP

NAM President Victor J. Dzau presented the Academy's first Presidential Citation for Exemplary Leadership to Anthony S. Fauci, NAM member and director of the National Institute for Allergy and Infectious Diseases (NIAID) at the 2020 Annual Meeting for his work in the fields of biomedical science, health care, and public health in the United States.

Fauci earned the recognition for his decades-long career contributing visionary guidance in biomedical research globally and nationally. During the COVID-19 pandemic, his unwavering, trusted voice on behalf of science-based policy and public health offered strong and steady leadership during the largest global health crisis in recent history.

In his role as director of NIAID, service that spans nearly 40 years, he has served six U.S. presidential administrations as a trusted strategic advisor. During his distinguished tenure, Fauci has addressed numerous global crises including HIV/AIDS, SARS, anthrax, influenza, and Ebola. He has pioneered advances in human immunoregulation and lifesaving therapies for rare immune disorders and conducted groundbreaking research in the prevention and treatment of HIV/AIDS — contributions that have impacted countless lives.

In addition to the Presidential Citation, Fauci was also awarded the **NAM Gustav O. Lienhard Award for Advancement of Health Care** in recognition of his role as a leader of federal research and policy on infectious diseases and, in particular, for his deft, scientifically-grounded leadership in shaping an effective response to the COVID-19 pandemic.



National Academy of Medicine

Presidential Citation for Exemplary Leadership

is awarded to

Anthony S. Fauci

In recognition of extraordinary service and outstanding contributions to biomedical science, health care, and public health in the United States, in particular:

Pioneering advances in the field of human immunoregulation and lifesaving therapies for rare immune disorders;

Seminal research and groundbreaking leadership in prevention and treatment of HIV/AIDS, impacting countless lives now and in the future;

Enduring, visionary guidance to the field of biomedical research globally and nationally;

Unprecedented public service as director of the National Institute of Allergy and Infectious Diseases for nearly four decades;

Distinguished service as a trusted advisor to six U.S. presidents, during public health crises including HIV/AIDS, SARS, anthrax, influenza, and Ebola;

Firm and steady leadership during the COVID-19 pandemic, offering an unwavering, trusted voice to the nation and the world on behalf of science-based policy and public health.

In recognition of these achievements, the National Academy of Medicine hereby issues its first-ever citation for exemplary leadership and service – to the Academy, to science, to public health, and to society.

October 19, 2020

Victor J. Dzau, MD
President

NATIONAL ACADEMY OF MEDICINE

GUSTAV O. LIENHARD AWARD FOR ADVANCEMENT OF HEALTH CARE

The 2020 Lienhard Award was presented to Anthony S. Fauci, the director of the National Institute of Allergy and Infectious Diseases (NIAID) for his role as a leader of federal research and policy on infectious diseases and, in particular, for his deft, scientifically grounded leadership in shaping an effective response to the COVID-19 pandemic.

At NIAID, Dr. Fauci oversees an extensive portfolio of basic and applied research to prevent, diagnose, and treat infectious diseases such as HIV/AIDS, tuberculosis, and malaria, as well as emerging and re-emerging diseases such as Ebola and Zika, and has advised six U.S. presidents on many domestic and global health issues. Dr. Fauci has made critical discoveries that have advanced the understanding and treatment of HIV and AIDS and played a critical role in designing the U.S. and global response to the epidemic. He was instrumental in the creation of the President's Emergency Plan for AIDS Relief (PEPFAR), which has saved millions of lives globally.

In 2019 and 2020, Dr. Fauci served as a top advisor to the government on the response to the COVID-19 pandemic and led NIAID-sponsored research on how to prevent and treat SARS-CoV-2 and COVID-19.

Dr. Fauci is the 35th recipient of the Lienhard Award. Given annually, the award recognizes outstanding national achievement in improving personal health care in the United States. Nominees are eligible for consideration without regard to education or profession, and award recipients are selected by a committee of experts convened by the National Academy of Medicine. The 2020 selection committee was chaired by Donald M. Berwick, MD, president emeritus and senior fellow, Institute for Healthcare Improvement; and former administrator, Centers for Medicare and Medicaid Services.

The Lienhard Award is funded by an endowment from the Robert Wood Johnson Foundation. Gustav O. Lienhard was chair of the foundation's board of trustees from the organization's establishment in 1971 to his retirement in 1986 – a period in which the foundation moved to the forefront of American philanthropy in health care. Lienhard, who died in 1987, built his career with Johnson & Johnson, beginning as an accountant and retiring 39 years later as its president.

RHODA AND BERNARD SARNAT INTERNATIONAL PRIZE IN MENTAL HEALTH

The 2020 Sarnat Prize was awarded to Stephen P. Hinshaw, professor of psychology at the University of California, Berkeley, and professor of psychiatry and behavioral sciences and vice chair for child and adolescent psychology at the University of California, San Francisco, for his research on inattention and impulse-control problems in children, as well as his work on reducing mental illness stigma.

Dr. Hinshaw has been the principal investigator at the Berkeley site for the Multimodal Treatment Study of Children with ADHD since 1992, and his core work on this study has revealed the mediation of behavioral change at school by enhanced parenting practices. Dr. Hinshaw's work spans developmental psychopathology, clinical interventions with children and adolescents, and program development related to reducing the widespread stigmatization of mental illness. Dr. Hinshaw's work has received international acclaim, integrating the psychobiological underpinnings of ADHD with the reality of school-based policies that may spuriously increase rates of diagnosed prevalence.

Hinshaw has also mentored new generations of investigators in child and adolescent mental health, having taught thousands of undergraduates and hundreds of doctoral students. Before attending graduate school, Hinshaw directed residential summer camps and alternative schools for youth with mental and developmental disabilities, and has continued to direct summer treatment and research programs for youth with ADHD and longitudinal investigations into adulthood. Hinshaw has worked with foundations and nonprofit organizations to develop models of action and contact-based high-school clubs to overcome mental illness stigma, and has formally evaluated such efforts.

Since 1992, the Sarnat Prize has been presented to individuals, groups, or organizations that have demonstrated outstanding achievement in improving mental health. The prize recognizes

– without regard for professional discipline or nationality – achievements in basic science, clinical application, and public policy that lead to progress in the understanding, etiology, prevention, treatment, or cure of mental disorders, or to the promotion of mental health. As defined by the nominating criteria, the field of mental health encompasses neuroscience, psychology, social work, nursing, psychiatry, and advocacy.

The award is supported by an endowment created by Rhoda and Bernard Sarnat of Los Angeles. Rhoda Sarnat was a licensed clinical social worker, and Bernard Sarnat was a plastic and reconstructive surgeon and researcher. The Sarnats' concern about the destructive effects of mental illness inspired them to establish the award. The 2020 selection committee was chaired by Gary L. Gottlieb, MD, MBA, professor of psychiatry, McLean Hospital and Harvard Medical School.

NAM MEMBER AWARDS

The NAM honored three members in 2020 for their outstanding service. The honorees are **David Relman**, Thomas C. and Joan M. Merigan Professor in Medicine and professor of microbiology and immunology at Stanford University; **David Eaton**, dean and vice provost emeritus of the Graduate School of the University of Washington; and **Sara Rosenbaum**, Harold and Jane Hirsh Professor of Health Law and Policy at George Washington University.

"I am delighted to honor these extraordinary members who have demonstrated their significant leadership and dedication to improving health and furthering science," said National Academy of Medicine President Victor J. Dzau. "Year after year, their generous service to the NAM and the National Academies in so many roles has been critical to our work helping to shape sound policies and address challenges in some of today's most complex issues in health and medicine."

David Relman received the Walsh McDermott Medal, which is awarded to a member for distinguished service to the National Academies of Sciences, Engineering, and Medicine over an extended period. His contributions have been focused at the intersection of microbiology, emerging infectious diseases, national and international security, and the ongoing revolution in the life sciences and associated technologies. Since 2002, he has served on 15 committees, boards, or forums, including as chair, co-chair, or vice chair for four of them. During Relman's time chairing the Forum on Microbial Threats from 2007-2017, he strengthened laboratory science as part of the forum's approach and helped spearhead early leadership in promoting the beneficial roles of microbial communities in human, animal, plant, and environmental health. In addition, Relman has advised on many workshops, including several meetings with foreign academies of science that were to address technical and potentially sensitive issues in international security and arms control. Relman helped lead influential studies that had a lasting impact on science policy in the United States and around the world. For example, the 2006 report *Globalization, Biosecurity, and the Future of the Life Sciences* resulted in the development of a process by which technological advances might be assessed and future risks of their malevolent use considered. In addition, Relman was vice chair for a 2011 study that reviewed the scientific approaches used during the FBI's investigation of the 2001 anthrax mailings. He currently chairs a standing committee that is advising the U.S. Department of State on unexplained health effects in government employees at overseas embassies. During the COVID-19 pandemic, Relman is playing an active role in the National Academies' efforts to provide rapid responses to questions from the White House Office of Science and Technology Policy on various matters related to understanding SARS-CoV-2.

David Eaton was awarded the David Rall Medal, which is given to a member who has demonstrated distinguished leadership as chair of a study committee or other such activity, showing a commitment substantially above and beyond the usual expectations. An NAM member since 2011, Eaton is a leader in environmental health research and policy. Beginning with his participation on the Board on Environmental Studies and Toxicology from 1996-1999, Eaton has chaired three consensus study committees, been a member of five others,

and served as reviewer and review coordinator of several other projects. Most notably, under his leadership, the Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems authored an impactful report in 2018 on the public health consequences of e-cigarettes that is still cited widely today. As a committee chair, Eaton is known for encouraging camaraderie among committee members, allowing for collective thinking to evolve while balancing the need to bring ideas into a cohesive report, helping facilitate agreement among members by drawing them back to the evidence, and bringing together the talents and expertise of all involved to the final product.

Sara Rosenbaum received the Adam Yarmolinsky Medal, which is awarded to a member from a discipline outside the health and medical sciences who has contributed to the mission of the NAM over a significant period. Rosenbaum is a leading scholar of health law and public health, particularly related to the law governing the Medicaid and Children's Health Insurance Program (CHIP) programs. She has advised presidential administrations and Congress on issues ranging from national health reform and financing the health care safety net to child health policy and the application of federal civil rights laws to health care. Since becoming an NAM member in 2012, Rosenbaum served as a member of the Report Review Committee for six years, chair of the Committee on the Evaluation of the Supplemental Security Income Disability Program for Children with Speech Disorders and Language Disorders, and the Section 11 (social sciences, humanities, and law) chair and vice chair on the NAM Membership Committee. Rosenbaum's significant contributions to the NAM prior to becoming a member include serving on the Robert Wood Johnson Health Policy Fellowships Board, Committee on an Oral Health Initiative, Committee on Review of Priorities in the National Vaccine Plan, as well as consensus study committees focused on vaccine and immunization financing and policies and access to health care services. Rosenbaum is known for her creativity translating policy into law and discipline in legal analysis and legislative drafting, along with her unwavering commitment to the underserved, particularly children.

CECIL AWARDS

Each year, the NAM presents three Cecil Awards, recognizing and celebrating current and/or recent staff whose sustained service has contributed importantly to progress toward the NAM mission – to improve health for all by advancing science, accelerating health equity, and providing independent, authoritative, and trusted advice nationally and globally.

Sandra H. Matthews Cecil Award for Administrative Excellence:

- Annalee Espinosa Gonzales
  Administrative Assistant
  Health and Medicine Division

Cecil Award for Individual Excellence:

- Tracy Lustig
  Senior Program Officer
  Health and Medicine Division

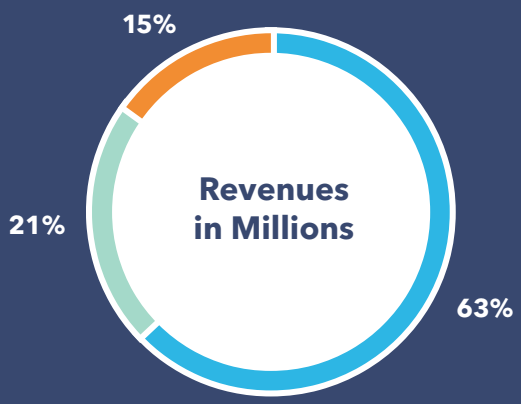
National Academies Cecil Award for Excellence of a Group/Team:

- Emily Backes
- Natacha Blain
- Ivory Clarke
- Mary Ghitelman
- Samantha Phillips
- Kirsten Sampson Snyder
- Dara Shefska
- Doug Sprunger
- Elizabeth Townsend
- Yvonne Wise

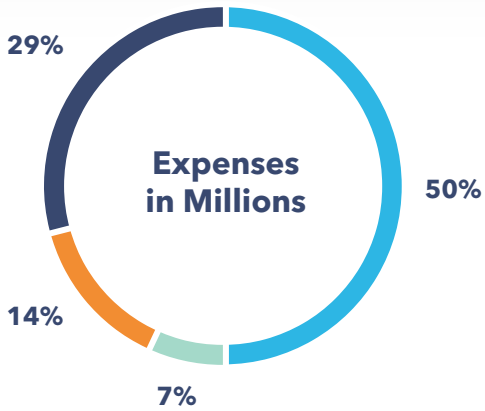
Culture of Health: The Promise of Adolescence Team

- Division of Behavioral and Social Sciences and Education
- Health and Medicine Division
- National Academy of Medicine
- Office of the Chief Communications Officer

FINANCES



Grants, Contributions & Other	$10.2
NRC Indirects	$3.5
Endowment Payout	$2.5



Programs	$7.7
Membership & Council	$1.1
Health & Policy Fellowships	$2.1
Operations	$4.5

2020 REVENUES

63%

of NAM revenues are from grants and contributions are by external donors

21%

of NAM revenues are from the indirect cost pool of the National Research Council, the primary source of funds supporting Operations

15%

of revenue is from endowment payout, which supports both Operations and Programs

2020 EXPENSES

64%

of expenses support program activities

29%

of expenses support General Operations, including the President's, Executive, Development, Foreign Secretary and Home Secretary offices

7%

7% of expenses support Membership and NAM Council activities

44%

total staff at the close of the fiscal year with 2 additional positions under recruitment

The NAM budget supports two main areas of activity: General Operations and Program.

General Operations includes the Executive Office as well as Development, Communications, Finance, Program Development, Membership and Council Services, and joint National Academies expenses.

Program includes Culture of Health, Action Collaborative on Clinician Well-Being and Resilience, Action Collaborative on Countering the U.S. Opioid Epidemic, Healthy Longevity Global Grand Challenge, Vital Directions in Health and Health Care, Grand Challenge on Human Health and Climate Change, and the Leadership Consortium for a Value and Science-Driven Health System, among other projects and activities. Fellowships are a distinct program and are reflected separately in the chart above.

DONOR APPRECIATION

NAM DONOR STORY

Louis Lange

Despite the hardships we faced in 2020, our dedicated donors ensured that the vital work of the National Academy of Medicine continued by donating over $11,000,000 in financial support. Louis Lange, M.D., Ph.D., shares his story on why he decided to make an impact through philanthropy.

1. What inspired you to make this gift?

I believe we are in a golden age of biomedicine research. One can see its progress with the COVID vaccine. It's amazing what has been accomplished in a year, and it's because we have funded the basic and clinical development work for many decades and this is a great continuation of it.

2. What is your relationship to the NAM?

My relationship with the NAM is mostly through President Victor J. Dzau. We met while training together at Harvard in the 70s and have been friends ever since, both professionally and personally. I like Victor's leadership and vision and I want to support him.

3. Why was it important for you, at this time, to make your gift?

For me, it is a natural progression of giving. I have served on a university board and contributed in that way, and this is another opportunity to give and support medical science.

I've been with two research foundations, I was the chairman of Lee Hood's Institute for Systems Biology, and I spent 10 years with the Gladstone Foundation at UCSF in San Francisco. I have a long history of association in academia and serving on boards of institutions. I have a good understanding of where the best science is being done, and I think the National Academy of Medicine pulls together a lot of great scientists and medical doctors.

4. What do you want others to know about your philanthropy?

I think it is important to give unrestricted funding to leaders and let them use the money wisely. I also wanted to support the Healthy Longevity Initiative. My recent gift was a general gift for the President but it also had some earmarks in an area that needed support.

5. What is your hope for the future of medicine?

We are seeing medicine at work every day – we are seeing it in the vaccine rollout for COVID, in new gene therapies getting approved and saving lives, and we see it in novel cancer therapies that are exploding. Cancer drug development is no longer a question of "if." The more money that goes in, the more cures we are going to have because the science is there. We are going to be curing many difficult-to-treat chronic diseases.

6. Is there anything else you would like for us to include in your story?

My background is in multidisciplinary sciences. I was an early M.D., Ph.D., and a combined basic science with clinical medicine in cardiology. I think integrated science is the path for solutions for patient needs.

Behind every gift is a meaningful and inspiring story. The National Academy of Medicine is grateful for the generosity of all of our donors. A special thanks to Dr. Lange, who shared the importance of advancing the medical sciences in this meaningful way.

Now, more than ever, our evidence-based guidance is needed to help lead the country and world out of the COVID-19 pandemic and through the recovery phase that will follow. With your support and belief in our vision of a healthier future for all, we can achieve so much.

2020 HONOR ROLL OF DONORS

We gratefully acknowledge the support of private contributors to the National Academy of Medicine. The collective, private philanthropy of our members and friends helps to enhance the NAM's mission to lead, inspire innovation and impact the health of all people.

Lifetime Giving Societies

We gratefully acknowledge the following members and friends who have made generous charitable lifetime contributions. Their collective, private philanthropy enhances the impact of the academies as advisor to the nation on matters of science, engineering, and medicine.

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